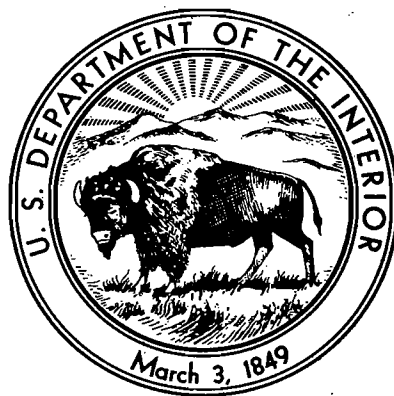


**FINAL  
ENVIRONMENTAL STATEMENT  
FOR THE  
PROTOTYPE OIL SHALE LEASING PROGRAM**

**Volume V of VI**

**Letters Received  
During Review Process**



**U.S. DEPARTMENT OF THE INTERIOR  
1973**

**F I N A L**  
**ENVIRONMENTAL STATEMENT**  
**FOR THE**  
**PROTOTYPE OIL SHALE LEASING PROGRAM**

**Volume V of VI**  
**Letters Received**  
**During the**  
**Review Process**

**Prepared in Compliance With**  
**Section 102 (2) (c) of the National Environmental**  
**Policy Act of 1969**

**Prepared by**  
**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**1973**

## SUMMARY

### Final Environmental Statement Department of the Interior, Office of the Secretary

1. Administrative type of action:

2. Brief description of action:

This action would make available for private development up to six leases of public oil shale lands of not more than 5,120 acres each. Two tracts are located in each of the States of Colorado, Utah, and Wyoming.

Such leases would be sold by competitive bonus bidding and would require the payment to the United States of royalty on production. Additional oil shale leasing would not be considered until development under the proposed program had been satisfactorily evaluated and any additional requirements under the National Environmental Policy Act of 1969 had been fulfilled.

3. Summary of environmental impact and adverse environmental effects:

Oil shale development would produce both direct and indirect changes in the environment of the oil shale region in each of the three States where commercial quantities of oil shale resources exist. Many of the environmental changes would be of local significance, and others would be of an expanding nature and have cumulative impact. These major regional changes will conflict with uses of the other physical resources of the areas involved. Impacts would include those on the land itself, on water resources and air quality, on fish and wildlife habitat, on grazing and agricultural activities, on recreation and aesthetic values, and on the existing social and economic patterns as well as others. The environmental impacts from both prototype development at a level of 250,000 barrels per day of shale oil and an industry producing a possible 1 million barrels per day by 1985 are assessed for their anticipated direct, indirect and cumulative effects.

4. Alternatives considered:

- A. Government development of public oil shale lands.
- B. Change in number and location of tracts to be leased.
- C. Delay in development of public oil shale lands.
- D. No development of public oil shale lands.
- E. Unlimited leasing of public oil shale lands.
- F. Obtaining energy from other sources.

5. Comments have been requested from the following:

Federal agencies, State agencies, and private organizations listed in Volume IV, Section F.

6. Date made available to the Council on Environmental Quality and the Public:

Draft Statement: September 7, 1972

Final Statement:

## INTRODUCTORY NOTE

THIS FINAL ENVIRONMENTAL STATEMENT HAS BEEN PREPARED PURSUANT TO SECTION 102 (2) (C) OF THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 U.S.C. SECS. 4321-4347). ITS GENERAL PURPOSE IS A STUDY OF THE ENVIRONMENTAL IMPACTS OF OIL SHALE DEVELOPMENT.

THE SECRETARY OF THE INTERIOR ANNOUNCED PLANS ON JUNE 29, 1971, FOR THIS PROPOSED PROGRAM AND RELEASED A PRELIMINARY ENVIRONMENTAL STATEMENT, A PROGRAM STATEMENT, AND REPORTS PREPARED BY THE STATES OF COLORADO, UTAH, AND WYOMING ON THE ENVIRONMENTAL COSTS AND PROBLEMS OF OIL SHALE DEVELOPMENT.

THE PROPOSED PROGRAM IS IN CONCERT WITH THE PRESIDENT'S ENERGY MESSAGE OF JUNE 4, 1971, IN WHICH HE REQUESTED THE SECRETARY OF THE INTERIOR TO INITIATE "A LEASING PROGRAM TO DEVELOP OUR VAST OIL SHALE RESOURCES, PROVIDED THAT ENVIRONMENTAL QUESTIONS CAN BE SATISFACTORILY RESOLVED."

AS PART OF THE PROGRAM, THE DEPARTMENT AUTHORIZED INFORMATIONAL CORE DRILLING AT VARIOUS SITES IN COLORADO, WYOMING, AND UTAH AND 16 CORE HOLES WERE COMPLETED. THE DEPARTMENT REQUESTED NOMINATIONS OF PROPOSED LEASING TRACTS ON NOVEMBER 2, 1971, AND A TOTAL OF 20 INDIVIDUAL TRACTS OF OIL SHALE LAND WERE NOMINATED. WITH THE CONCURRENCE OF THE CONCERNED STATES, THE DEPARTMENT OF THE INTERIOR ANNOUNCED ON APRIL 25, 1972, THE SELECTION OF SIX OF THESE TRACTS, TWO EACH IN COLORADO, UTAH, AND WYOMING.

THE PROGRAM IS ESSENTIALLY UNCHANGED FROM THAT ANNOUNCED ON JUNE 29, 1971, BUT THE PRELIMINARY STATEMENT ISSUED AT THAT TIME



WAS EXPANDED TO CONSIDER THE IMPACT OF MATURE OIL SHALE DEVELOPMENT, THE IMPACT OF DEVELOPMENT OF THE SIX SPECIFIC TRACTS, AND A COMPREHENSIVE ANALYSIS OF OTHER ENERGY ALTERNATIVES.

THE DRAFT OF THIS FINAL ENVIRONMENTAL STATEMENT WAS RELEASED TO THE PUBLIC ON SEPTEMBER 7, 1972. A PUBLIC REVIEW PERIOD WAS HELD THAT ENDED ON NOVEMBER 7, 1972. THIS REVIEW PROVIDED IMPORTANT INFORMATION UPON WHICH TO EXPAND AND CORRECT, WHERE APPROPRIATE, THE DRAFT MATERIAL.

VOLUME I OF THIS FINAL SET OF SIX VOLUMES PROVIDES AN ASSESSMENT OF THE CURRENT STATE OF OIL SHALE TECHNOLOGY AND DESCRIBES THE REGIONAL ENVIRONMENTAL IMPACT OF OIL SHALE DEVELOPMENT AT A RATE OF ONE MILLION BARRELS PER DAY BY 1985. VOLUME II EXTENDS THIS STUDY WITH AN EXAMINATION OF ALTERNATIVES TO THE ONE MILLION BARREL PER DAY LEVEL OF SHALE OIL PRODUCTION. VOLUMES I AND II THUS CONSIDER THE REGIONAL AND CUMULATIVE ASPECTS OF A MATURE OIL SHALE INDUSTRY.

VOLUME III EXAMINES THE SPECIFIC ACTION UNDER CONSIDERATION, WHICH IS THE ISSUANCE OF NOT MORE THAN TWO PROTOTYPE OIL SHALE LEASES IN EACH OF THE THREE STATES OF COLORADO, UTAH, AND WYOMING. ITS FOCUS IS ON THE SPECIFIC ENVIRONMENTAL IMPACTS OF PROTOTYPE DEVELOPMENT ON PUBLIC LANDS WHICH, WHEN COMBINED, COULD SUPPORT A PRODUCTION POTENTIAL OF ABOUT 250,000 BARRELS PER DAY.

VOLUME IV DESCRIBES THE CONSULTATION AND COORDINATION WITH OTHERS IN THE PREPARATION OF THE FINAL STATEMENT, INCLUDING COMMENTS RECEIVED AND THE DEPARTMENT'S RESPONSES. LETTERS RECEIVED DURING THE REVIEW PROCESS ARE REPRODUCED IN VOLUME V, AND ORAL TESTIMONY IS CONTAINED IN VOLUME VI.

THIS DOCUMENT IS BASED ON MANY SOURCES OF INFORMATION, INCLUDING RESEARCH DATA AND PILOT PROGRAMS DEVELOPED BY BOTH THE GOVERNMENT AND PRIVATE INDUSTRY OVER THE PAST 30 YEARS. MANY FACTORS, SUCH AS CHANGING TECHNOLOGY, EVENTUAL OIL PRODUCTION LEVELS, AND ATTENDANT REGIONAL POPULATION INCREASES ARE NOT PRECISELY PREDICTABLE. THE IMPACT ANALYSIS INCLUDED HEREIN IS CONSIDERED TO CONSTITUTE A REASONABLE TREATMENT OF THE POTENTIAL REGIONAL AND SPECIFIC ENVIRONMENTAL EFFECTS THAT WOULD BE ASSOCIATED WITH OIL SHALE DEVELOPMENT.

IT SHOULD BE NOTED THAT SUBSTANTIAL AMOUNTS OF PUBLIC LANDS IN ADDITION TO THE PROTOTYPE TRACTS WOULD BE REQUIRED FOR AN INDUSTRIAL DEVELOPMENT TO THE ONE MILLION BARREL PER DAY LEVEL CONSIDERED IN VOLUMES I AND II. IF EXPANSION OF THE FEDERAL OIL SHALE LEASING PROGRAM IS CONSIDERED AT SOME FUTURE TIME, THE SECRETARY OF THE INTERIOR WILL CAREFULLY EXAMINE THE ENVIRONMENTAL IMPACT WHICH HAS RESULTED FROM THE PROTOTYPE PROGRAM AND THE PROBABLE IMPACT OF AN EXPANDED PROGRAM. BEFORE ANY FUTURE LEASES ON PUBLIC LANDS ARE ISSUED, AN ENVIRONMENTAL STATEMENT, AS REQUIRED BY THE NATIONAL ENVIRONMENTAL POLICY ACT, WILL BE PREPARED.

## AVAILABILITY OF FINAL ENVIRONMENTAL STATEMENT

The six-volume set may be purchased as a complete set or as individual volumes from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402; the Map Information Office, Geological Survey, U.S. Department of the Interior, Washington, D. C. 20240; and the Bureau of Land Management State Offices at the following addresses: Colorado State Bank Building, 1600 Broadway, Denver, Colorado, 80202; Federal Building, 124 South State, Salt Lake City, Utah, 84111; and Joseph C. O'Mahoney Federal Center, 2120 Capital Avenue, Cheyenne, Wyoming, 82001.

Inspection copies are available in the Library and the Office of the Oil Shale Coordinator, U.S. Department of the Interior, Washington, D. C., and at depository libraries located throughout the Nation. The Superintendent of Documents may be consulted for information regarding the location of such libraries. Inspection ~~copies~~ are also available in Denver, Colorado, in the Office of the Deputy Oil Shale Coordinator, Room 237E, Building 56, Denver Federal Center, Denver, Colorado 80225, in all the Bureau of Land Management State Offices listed above, and in the following Bureau of Land Management district offices: Colorado: Canon City, Craig, Glenwood Springs, Grand Junction, Montrose; Utah: Vernal, Price, Monticello, Kanab, Richfield; Wyoming: Rock Springs, Rawlins, Casper, Lander, Pinedale, Worland.

## I. LETTERS RECEIVED DURING THE REVIEW PROCESS

The Draft Environmental Statement for the Proposed Prototype Oil-Shale Leasing Program was released by the Department of the Interior on September 7, 1972. Notice of availability of the Draft Statement was published in the Federal Register, pages 18098 + 18099, vol. 37, No. 174, Thursday, September 7, 1972. In that same location, a notice was also published announcing that public hearings on the Draft Statement were to be held in the state capitol of the three States involved, Colorado, Wyoming, and Utah, and in three cities of those same States near the proposed lease sites. The published notice announced that written comments would be received on the Draft Statement for a period of 45 days (until October 23, 1972) after the publication of the notice. This deadline was later extended by the Secretary of the Interior to November 7, 1972, responding to comments received both in writing and at the public hearings requesting an extension in time.

Written comments were received from 17 Federal agencies, one U.S. Congressman, seven State agencies, 27 environmental conservation groups, 24 private industrial companies, 123 private citizens, and three miscellaneous groups. These written comments totalled 1939 pages, including 1102 pages of appended materials.

Testimony was received from 95 individuals at the public hearings held during the week of October 10 to 13, 1972.

Transcripts of this testimony comprised 450 pages and are reproduced in Volume VI. In addition to the oral testimony, materials were submitted to the Director, Office of Hearings and Appeals, that totalled 388 pages. These materials were designated as "Exhibits" of the particular public hearing at which these were submitted.

All of the written comments and hearings material was systematically indexed by the Department of the Interior and the indexed material was made available to the specialists involved in the preparation of the Final Environmental Statement. Reproductions of all letters received by the Department are contained in this volume. The material appended with the written comments, the hearing exhibits, and other public documents, are listed in Chapter II, Section C, of this volume. These materials are available for public inspection in the Office of the Oil Shale Coordinator, U.S. Department of the Interior, Washington, D.C.

20240.

## II. LIST OF REFERENCES (PUBLIC PARTICIPATION)

### A. List of Groups and Individuals Submitting Written Comments

#### 1. Federal Agencies

##### Reference No.

1. Bureau of Indian Affairs, U.S. Department of the Interior  
John O. Crow, Deputy Commissioner, Washington, D.C. 20242
2. Bureau of Land Management, Burt Silcock, Director, Washington,  
D.C. 20240
3. Bureau of Mines, U.S. Department of the Interior, O. M. Bishop,  
Office of the Chief, Intermountain Field Operation Center,  
Bldg. 20, Denver Federal Center, Denver, Colorado 80225
4. Bureau of Mines, U.S. Department of the Interior, Paul Zinner,  
Acting Director, Washington, D.C. 20240
5. Bureau of Outdoor Recreation, U.S. Department of the Interior,  
Jerome F. Anderson for James G. Watt, Director,  
Washington, D.C. 20240
6. Bureau of Reclamation, U.S. Department of the Interior, Ellis L.  
Armstrong, Commissioner of Reclamation, Washington, D.C.  
20240
- 6a. Bureau of Sport Fisheries and Wildlife, U.S. Department of the  
Interior, F. V. Schmidt, Deputy Director, Washington, D.C.  
20240
7. Environmental Protection Agency, Sheldon Meyers, Director,  
Office of Federal Activities, Washington, D.C. 20460
- 7a. Federal Power Commission, John N. Nassikas, Chairman,  
Washington, D.C. 20426
8. Geological Survey, U.S. Department of the Interior,  
J. R. Balsey, Acting Director, Washington, D.C. 20242
9. National Park Service, U.S. Department of the Interior,  
Theodore R. Swem, Assistant Director, Cooperative  
Activities, Washington, D.C. 20240
10. Office of Coal Research, U.S. Department of the Interior,  
George Fumich, Jr., Acting Director of Coal Research,  
Washington, D.C. 20240
11. Office of Emergency Preparedness, G. A. Lincoln, Director,  
Washington, D.C. 20504

Reference No.

12. Soil Conservation Service, U.S. Department of Agriculture, M. D. Burdick, State Conservationist, P. O. Box 17107, Denver, Colorado 80217
13. U.S. Atomic Energy Commission, Robert J. Catlin, Director, Division of Environmental Affairs, Washington, D.C. 20545
14. U.S. Department of Commerce, Sidney R. Galler, Deputy Assistant Secretary for Environmental Affairs, Washington, D.C. 20230
15. U.S. Department of Health, Education, and Welfare, Rulon R. Garfield, Regional Director, Region VIII, 19th and Stout Streets, Denver, Colorado 80202
16. U.S. Department of Housing and Urban Development, Michael T. Kastanek, Assistant Regional Administrator, Community Planning and Development, Federal Building, 19th and Stout Streets, Denver, Colorado 80202
17. U.S. Department of the Navy, Naval Petroleum and Oil Shale Reserves, J. P. Trunz, Jr., Commander, CEC, USN, Director, Washington, D.C. 20360

2. U.S. Congress

18. Vanick, Charles A., U.S. Representative from the 22nd District of Ohio, 2453 Rayburn Building, Washington, D.C. 20515

3. State Agencies

19. Colorado Department of Health, Roy L. Cleere, M.D., M.P.H., Executive Director, 4210 E. 11th Avenue, Denver, Colorado 80220
20. Colorado River Water Conservation District, by Kenneth Balcomb, Delaney and Balcomb, Attorneys, 829 Grand Avenue, Drawer 790, Glenwood Springs, Colorado 81601
21. Department of Economic Planning and Development, John T. Goodier, Chief of Mineral Development, 720 West 18th Street, Cheyenne, Wyoming 82001
22. State of California, Colorado River Board of California, Myron B. Holburt, Chief Engineer, 302 California State Building, 217 West First Street, Los Angeles, California 90012

Reference No.

23. State of Colorado, Division of Wildlife, Harry B. Woodward,  
Director, 6060 Broadway, Denver, Colorado 80216
24. University of Denver, Denver Research Institute, John J.  
Schanz, Jr., University Park, Denver, Colorado 80210
25. Wyoming Game and Fish Commission, James B. White, Commissioner,  
Cheyenne, Wyoming 82001

4. Environmental-Conservation Groups

26. Colorado Bowhunters Association, Inc., Gerald L. Egbert, Board  
of Directors, 2085 Nome Street, Aurora, Colorado 80010
27. Colorado Environmental Health Association, Raymond Mohr,  
Environmental Planning Commission, Denver, Colorado 80202
28. Colorado Environmental Legal Services, Inc., Gary E. Parrish,  
Box 207, Englewood, Colorado 80110
29. Colorado Open Space Council, Inc., V. Crane Wright, President,  
1742 Pearl Street, Denver, Colorado 80203
30. Colorado Open Space Council, Inc., Carolyn R. Johnson,  
Chairman COSC Mining Workshop, Co-Chairman COSC Oil-Shale  
Committee, 1742 Pearl Street, Denver, Colorado 80203
31. Colorado Open Space Council, Inc., Sue Bollman, Vice-Chairman  
Mining Workshop, 5850 E. Jewell Street, Denver, Colorado 80203
32. Colorado Open Space Council, Inc., Charles Wanner, Wilderness  
Workshop, 1742 Pearl Street, Denver, Colorado 80203
33. The Conservation Foundation, Arthur A. Davis, Vice-President  
for Operations, 1717 Massachusetts Avenue, N.W.,  
Washington, D.C. 20036
34. Daves Arboretum, M.C. Markham, Naturalist, Newark, Ohio
35. Denver Audubon Society, Allen W. Stokes, Jr., Oil Shale  
Workshop, 1742 Pearl Street, Denver, Colorado 80203
36. Environmental Policy Center, Bruce C. Driver, 324 C. Street,  
S. E., Washington, D.C. 20003



Reference No.

37. Natchitoches Audubon Society, Patricia J. Lewis, Secretary,  
1042 Oma Street, Natchitoches, Louisiana 71457
38. National Audubon Society, Elvis J. Stahr, President, 950  
Third Avenue, New York, New York 10022
- \_\_\_ National Wildlife Federation (co-filed with the National  
Resources Defense Council, Reference No. 39).
39. Natural Resources Defense Council, Inc., Thomas B. Stoel, Jr.,  
and Edward L. Strohbehn, Jr., 1710 N Street, N.W.,  
Washington, D.C. 20036 (co-filed with the Wildlife Federation  
and the Sierra Club).
40. Orleans Audubon Society, Dr. Carolyn R. Morrillo, President,  
New Orleans, Louisiana
41. Plan Aurora, Charles Parks, 15350 East Tenth Avenue,  
Aurora, Colorado 80010
42. Rocky Mountain Center on the Environment, Roger P. Hansen,  
Executive Director, 4260 West Evans Avenue, Denver,  
Colorado 80222
43. Rocky Mountain Sportsmens Federation, Elmer White, Vice  
President, P.O. Box 52, Westminster, Colorado 80030
44. Sierra Club, Enos Mills Group, Jorge E. Castillo, Attorney,  
Suite 2422 Prudential Plaza, 1050 Seventeenth Street,  
Denver, Colorado 80202
45. Sierra Club, Uinta Chapter, Sara Michl, Land-Use Chairman,  
2169 Sherman Avenue, Salt Lake City, Utah 84108
- \_\_\_ Sierra Club (co-filed with the National Resources Defense  
Council, Reference No. 39).
46. Southwestern New Mexico Audubon Society, Norman O. Jette,  
President, P.O. Box 12, Pinos Altos, New Mexico 88053
47. Trout Unlimited, Robert M. Weaver, Executive Director of  
Colorado Council, 4260 E. Evans Avenue, Denver,  
Colorado 80222
48. Tucson Audubon Society, Lillian Pengry, Chairman, Conservation  
Legislation Committee, Tucson, Arizona
49. University of Colorado Wilderness Group, Jeffrey Poland,  
President, UMC 183-C, University of Colorado, Boulder,  
Colorado 80302
50. University of Wisconsin-Milwaukee, Department of Geography,  
Glen D. Weaver, Milwaukee, Wisconsin 53201

Reference No.

51. Utah Audubon Society, Arabelle McDonald, 611 South 1st East, Brigham City, Utah 84302
52. The Wilderness Society, Clifton R. Merritt, Director of Field Services, 4260 E. Evans Avenue, Denver, Colorado 80222

5. Private Industry

53. Amarillo Oil Company, E. S. Morris, President, Suite 800, Plaza One, P.O. Box 151, Amarillo, Texas 79105
54. American Petrofina, Inc., John R. Moran, Jr., Moran, Reidy, & Voorhees, Attorneys, 818 Patterson Building, Denver, Colorado 80202
55. APCO Oil Corporation, H. F. Boles, Vice President, Exploration and Minerals, 17th Floor Houston National Gas Building, Houston, Texas 77002
56. Bell Petroleum Company, Holland and Hart, Attorneys, 500 Equitable Building, 730 Seventeenth Street, Denver, Colorado 80202
57. Cameron Engineers, Russell J. Cameron, President, 1315 Clarkson Street, Denver, Colorado 80210
58. Colony Development Operation, John S. Hutchins, Manager, 1500 Security Life Building, Denver, Colorado 80202
59. Development Engineering, Inc., John B. Jones, Jr., President, 1827 Grant Street, Denver, Colorado 80203
60. Diamond Shamrock Oil and Gas Company, Avery Rush, Jr., President, P.O. Box 631, Amarillo, Texas 79105
61. Geokinetics, Inc., Mitchell A. Lekas, President, Suite 300, 1875 Willow Pass Road, Concord, California 94520
62. Humble Oil & Refining Company, C. S. Fleischmann, Manager, P.O. Box 2180, Houston, Texas 77001
63. Koch Exploration Company, R. T. Bick, President, Box 2256, Wichita, Kansas 67201

Reference No.

64. Marathon Oil Company, G. R. Schoonmaker, Vice President, Exploration, Finlay, Ohio 45840
65. Mesa Petroleum Company, J. O. Upchurch, Vice President, P.O. Box 2009, Amarillo, Texas 79105
66. Offshore Operators Committee, Austin W. Lewis, Attorney, Liskow & Lewis, 225 Baronne Street, New Orleans, Louisiana 70112
67. The Oil Shale Corporation, John A. Whitcombe, Senior Vice President, 1600 Broadway, Denver, Colorado 80202
68. Phelps Dodge Company, Warren E. Fenzi, Executive Vice President, 300 Park Avenue, New York, New York 10022
69. Rocky Mountain Oil and Gas Association, Warren J. Hancock, President, Box 1555, Billings, Montana 59103
70. Shell Development Company, Thomas Baron, President, P.O. Box 2463, Houston, Texas 77001
71. Signal Oil and Gas Company, W.H. Thompson, Jr., 2800 North Loop West, Houston, Texas 77018
72. Sohio Petroleum Company, H. Pforzheimer, Vice President, Midland Building, Cleveland, Ohio 44115
73. Sun Oil Company, Fred M. Mayes, Vice President Development Projects, P.O. Box 2880, Dallas, Texas 75221
74. The Superior Oil Company, B. E. Weichman, P.O. Box 1521, Houston, Texas 77001
75. Utah Resources International, Inc., John H. Morgan, Jr., President, 709 Walker Bank Building, Salt Lake City, Utah 84111
76. Harrington, D. D., 701 First National Bank Building, Amarillo, Texas 79101. (For unidentified Company in U.S. Oil Shale Company Group).

Reference No.

6. Private Citizens

77. A Concerned Citizen, Fort Collins, Colorado 80521
78. Aulton, Michael A., 1706 Larch Street, Fort Collins, Colorado 80521
79. Bailey, James A., Assistant Professor of Wildlife Biology, Colorado State University, Fort Collins, Colorado 80521
80. Barnhalt, Barbara, #265 Ellis Hall, Fort Collins, Colorado 80521
81. Battle, Margaret, 162 N. Pleasant Street, Newark, Ohio 44857
82. Bell, Tom, Editor, High Country News, Lander, Wyoming 82520
83. Bench, Dan W., 310 19th Street, Boulder, Colorado 80302
84. Benedetti, Phyllis, Lake Hopatcong, New Jersey 07849 1/
85. Bires, Dennis E., 119 Wishart Drive, Beaver, Pennsylvania 15009
86. Boehme, Laurence M., Fort Collins, Colorado 80521
87. Bond, G. V., 12 Woodside Road, Fayetteville, New York 13066
88. Browne, Margaret, 955 Broadway, Boulder, Colorado 80302
89. Burchett, Stuart, Department of Chemistry, Southwestern State College, Weatherford, Oklahoma 73096
90. Burris, Tom, Box 99, RFD #4, Jefferson, Ohio 44047
91. Campbell, Scott, 2130 W. Prospect Street, Fort Collins, Colorado 80521
92. Casbar, Peter, 224 13th Street, Palisades Park, New Jersey 07650 1/
93. Caulfield, Doug, 2207 W. Oak Court, Apartment 1912, Fort Collins, Colorado 80521
94. Cavney, Kevin, Boulder, Colorado 80302
95. Chambers, Cliff, 709 Wagner Drive, Fort Collins, Colorado 80521
96. Clifford, Glen, 4820 T-Bird Circle #209, Boulder, Colorado 80303

1/ Identical letter as that received from Barbara Barnhalt. Her letter only reproduced in this volume.

Reference No.

97. Colgrove, Diane E., 1204 Stearns, 600 30th Street, Boulder, Colorado 80302
98. Colton, J. Blane, 593 S. Ogden, Denver, Colorado 80209
99. Connard, Lillian, Des Moines, Iowa 50309
100. Crowe, Robert M., 1212 Pine, Boulder, Colorado 80302
101. Custin, Henry W., B-207 Green Hall, Fort Collins, Colorado 80521 1/
102. Dann, John A. and Susan, 760 Clermont, Denver, Colorado 80220
103. Dawdy, Doris, 1312 Morgan Street, Fort Collins, Colorado 80521
104. Diemer, Corinne, Box 95, Leadville, Colorado 80461
105. Dillon, Mark, 214B Green Hall, Fort Collins, Colorado 80521 1/
106. Edwards, Bev, 8810 Birdwood, Houston, Texas 77036
107. Edwards, Nancy, 2034 W. Plum C-4, Fort Collins, Colorado 80521
108. Enyeart, Walt, Box 621, Georgetown, Colorado 80444
109. Erwin, Mark D., 611 Durward Hall, Colorado State University, Fort Collins, Colorado 80521 1/
110. Fendrich, Karen, Fort Collins, Colorado 80521 1/
111. Finlay, Terri, Oak Ridge, New Jersey 07438 1/
112. Finley, Joan, #130 Ellis Hall, Fort Collins, Colorado 80521 1/
113. Forselius, Randilyn, 2315 E. 7th Avenue, Denver, Colorado 80206
114. Foster, John C. Jr., 13995 W. 21st Street, Golden, Colorado 80401
115. Garule, Ronald, Fort Collins, Colorado 80521 1/
116. George, H. Glenn, 1535 Hanover, Aurora, Colorado 80010
117. Gless, George E., 2940 Thirteenth Street, Boulder, Colorado 80302
118. Goddard, Sally J., 1045 Arapahoe, Boulder, Colorado 80302
119. Gow, Keith J., Ellis Hall, Fort Collins, Colorado 80521 1/

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Reference No.

120. Graham, Pamela Sue, Allison Hall #261, Fort Collins, Colorado 80521
121. Gray, Evelyn M., 830 20th Street, #B-1, Boulder, Colorado 80302
122. Green, Timothy K., 8307 Ames Way, Arvada, Colorado 80003
123. Gustafson, Robin H., Box 234, Breckenridge, Colorado 80424
124. Haley, Jay S., Boulder, Colorado 80302
125. Hamilton, Bruce, 310 Peterson Street, Fort Collins, Colorado 80521
126. Harber, Kay, Environmental Corps (ECO), Box 711 Student Center, Colorado State University, Fort Collins, Colorado 80521
127. Hener, Karen, Box 4031, Aspen, Colorado 81611
128. Himes, Duncan and Carol, 4776 Heatherwood Court, Boulder, Colorado 80302
129. Hotchkiss, #143 Baker Hall, University of Colorado, Boulder, Colorado 80302
130. Houpt, Doris, 16 West Ridge Road, Media, Pennsylvania 19063
131. Huett, Gary, 230 N. 11th Avenue, Brighton, Colorado 80601
132. Isaacson, Cherrelyn and Amy Metsker, Fort Collins, Colorado 80521 1/
133. Janelle, Bob, B-214 Green Hall, Fort Collins, Colorado 80521 1/
134. Japhet, Michael L., 1044 Pleasant Street, Boulder, Colorado 80302
135. Journay, Frank, 271 So. Blvd., Saddle Brook, New Jersey 07662 1/
136. Jurgens, Esther B., 1203 Third Avenue, Longmont, Colorado 80501
137. Kerharich, Rud, 848 17th Street, Boulder, Colorado 80302
138. Kinghorn, Steven and Nancy, 1634 Walnut Street, Boulder, Colorado 80302
139. Kiver, Eugene, Rt. 3, Box 76, Cheney, Washington 99004

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Reference No.

140. Knudson, Ruthann, Editor, Newsletter of Lithic Technology, Washington State University, Pullman, Washington 99163
141. Louda, Mira, C210 Green Hall, Colorado State University, Fort Collins, Colorado 80521 1/
142. Lowenstein, Daniel, 302 Arnet Hall, University of Colorado, Boulder, Colorado 80302
143. Lowery, Dan, 152 Arnett Hall, Boulder, Colorado 80302
144. Lubchenco, Richard and Harriet, 901 W. Mountain Avenue, Fort Collins, Colorado 80521
145. McCargo, David Jr., 3300 So. Washington Street, Englewood, Colorado 80110
146. McCormick, John L., 342 C. Street, S.E., Washington, D.C. 20003
147. McCoy, F. C., 12734 Cullen Street, Whittier, California 90602
148. McElvain, Diane, 1254 Penna, Denver, Colorado 80203
149. McMillan, Ruth S., 103 Mechanic Vall, North East, Maryland 21901
150. Mercer, Mark Alan, 228 Newson Hall, Fort Collins, Colorado 80521
151. Merrill, Daniel R. and Dorothy B., RD1, Hawley, Pennsylvania 18428
152. Meyer, Robert, 116-1 Nimitz Drive, West Lafayette, Indiana 47906
153. Model, Robert, Majo Ranch, Valley, Wyoming 82414
154. Mork, Stuart E., Edwards Hall, Room 211, Fort Collins, Colorado 80521
155. Nettles, M. L., 2985 18th Street, Boulder, Colorado 80302
156. Nielsen, Wayne, Nielsen and Associates, P.O. Box 3241, Boulder, Colorado 80303
157. Okenreider, Mel, Lake Hopatcong, New Jersey 07849 1/
158. Osborn, Mark, 1729 Athens, Boulder, Colorado 80302
159. Padelford, L. J., 2504 Hancock Street, Bellevue, Nebraska 68005

1/ Identical letter as that received from Barbara Barnhalt. Her letter only reproduced in this volume.

Reference No.

160. Patchett, Docia I. and Ernestine I. Smith, 1524 Fair Oaks Ct.  
Santa Rosa, California 94504
161. Penner, Marcia, Hallett Hall, Box 303, Boulder, Colorado 80302
162. Petit, Barbara, 3635 Goodell Lane, Fort Collins, Colorado  
80521
163. Phelan, James L., Staff Attorney, University of Denver, College  
of Law, 209 16th Street, Denver, Colorado 80204
164. Phillips, Anne, Room 133 Ellis Hall, Fort Collins, Colorado  
80521 1/
165. Plymire, James, Linville, North Carolina 28646
166. Powell, Rose Anne, 318 West Laurel Street, Fort Collins,  
Colorado 80521
167. Powell, Michael and Carol, 715 Parker 2-C, Fort Collins,  
Colorado 80521
168. Reiswig, Barry, 710½ Colorado Avenue, Fort Collins, Colorado  
80521
169. Rinker, Marcia Kay, Corbett Hall H311, Fort Collins, Colorado  
80521 1/
170. Riske, Susan, Rt. 1, Box 440C Laramie, Wyoming 82070
171. Roark, Robert J., 931 Alpine Avenue, Boulder, Colorado 80302
172. Rodda, Gordon, 230 Andrews Hall, Boulder, Colorado 80302
173. Ruehle, Walter J., 14000 E. Progress Way, Denver, Colorado 80232
174. Satterthwaite, Pennington, 439 East 51st Street, New York,  
New York 10022
175. Shade, Janie, 225 Ingersoll Hall, Fort Collins, Colorado 80521
176. Shea, Daniel H. and Mary, 31 Pond Street, Apt. #13, Waltham,  
Massachusetts 02154
177. Sheldon, Dean E. Jr., 402 Northampton, Huron, Ohio 44839
178. Simkowski, Nancy, Inst. of Behavioral Sciences, University  
of Colorado, Boulder, Colo 80302
- 1/ Identical letter as that received from Barbara Barnhalt. Her letter  
only reproduced in this volume.



Reference No.

179. Smith, Ruth T., 1231 Hoover Street, Menlo Park, California 94025
180. Spratt, Michael J., Fort Collins, Colorado 80521 1/
181. Stegner, Patricia, 613 S. Sherwood, Fort Collins, Colorado  
80521
182. Stinson, Tom, Box 115 Libby Hall, University of Colorado,  
Boulder, Colorado 80302
183. Strasser, A. W., Rocky Run Road, Hawley, Pennsylvania 18428
184. Strong, Charles D., 1569 Eudora Street, Denver, Colorado 80220
185. Summers, W., 3415 Newton Street, Denver, Colorado 80221
186. Swanson, John R., P. O. Box 922, Berkeley, California 94701
187. Szkola, Randy, 212B Green Hall, Fort Collins, Colorado 80521 1/
188. Tischler, Sanford, 1504 South Whitcomb, Fort Collins, Colorado  
80521
189. Todd, Jeffrey W., 1201 W. Plum, Apartment C, Fort Collins,  
Colorado 80521
190. Travis, Maury M., Consulting Petroleum Technologist, 901  
Sherman Street, Denver, Colorado 80203
191. Twomey, Jill M., 1135 Lincoln, Boulder, Colorado 80302
192. Tyers, Debra, Room A210, Green Hall, Fort Collins, Colorado  
80521 1/
193. Veeneman, Robert, P.O. Box 234, Breckenridge, Colorado
194. Walter, Laura, 946½ Pratt Street, Longmont, Colorado 80501
195. Webb, William H., 1180 Edinboro Drive, Boulder, Colorado  
80303
196. Wenk, Robin Alexander, 593 S. Ogden, Denver, Colorado 80209
197. Wight, Susan, 1333 University Avenue, Boulder, Colorado
198. Wilson, Richard C., 211 Nimitz Drive, Des Plaines, Illinois 60018
199. Young, David L., 124 Briarwood Road #722, Fort Collins,  
Colorado 80521

1/ Identical letter as that received from Barbara Barnhalt. Her letter only reproduced in this volume.

Reference No.

7. Miscellaneous

200. American Forestry Association, William E. Towell, Executive Vice President, 1319 Eighteenth Street, N.W., Washington, D.C. 20036
201. Jirak, Edwin A., Mayor Town of Meeker, Colorado
202. League of Women Voters of Colorado

B. List of Groups and Individuals Appearing Before  
Public Hearings (Listed in Order of Appearance)

1. Denver, Colorado, Denver Federal Center, Auditorium  
October 10-11, 1972

Reference No.

- 203. Thomas Ten Eyck, on behalf of Colorado Governor  
John Love
- 204. Francis Brush, Democratic Candidate for U.S.  
Representative from Colorado
- 205. Pete Barrows, Colorado Division of Wildlife
- 206. John H. Tippet, Rio Blanco & Rio Verde Natural  
Gas Companies
- 207. Paul M. Dougan, Equity Oil Company
- 208. R. E. Foss, Sun Oil Company
- 209. Richard D. Ridley, Garrett Research & Development
- 210. Kenneth Canfield, Atlantic Richfield Company
- 211. John S. Hutchins, Colony Development Operation
- 212. John B. Tweedy, The Oil Shale Corporation
- 213. John Moran, Jr., for American Petrofina,  
Incorporated
- 214. Jorge E. Castillo, Sierra Club
- 215. Theodore Ellis, Sierra Club
- 216. Maury Travis, Travis International
- 217. John W. Rold, Colorado Geological Survey
- 218. Richard T. Ward, Colorado State University
- 219. Bruce Hamilton, Student, CSU Environmental Corps
- 220. Jeffery Todd, CSU Environmental Corps
- 221. Allen W. Stokes, Denver Audubon Society
- 222. Richard Speed, Environmental Action of Colorado

Reference No.

- 223. Cliff Chambers, Student, Colorado State University
- 224. Edwin J. Merrick, National Wildlife Federation
- 225. Ben Weichman, Superior Oil Company
- 226. Myron L. Corrin, Colorado State University
- 227. Charles Warner 1/, Wilderness Workshop, COSC
- 228. Hester McNulty, Colorado League of Women Voters
- 229. Eugene Weimer, Colorado Citizens for Clean Air and Energy Workshop, COSC
- 230. Richard H. Daley, Citizen, Fort Collins, Colorado
- 231. James L. Phelan, Citizen, Denver
- 232. Estella Leopold 2/, Denver Audubon Society
- 233. Edward Connors, Water Workshop, Colorado Open Space Council, Inc.
- 234. Gary Parrish, Plan Aurora (Colorado)
- 235. Charles D. Hoertz, Ashland Oil, Inc.
- 236. Jean Foster 3/, for Carol Snow
- 237. Donald Davis, Citizen, Denver
- 238. Mike Lekas, Geokinetics, Inc.
- 239. Gordon Rodda, University of Colorado Wilderness Group
- 240. Raymond Mohr, Colorado Environmental Health Association
- 241. Donald Davis, Colorado Grotto of the National Speleological Society
- 242. Libby Goodwin, Boulder Audubon Society
- 243. Betty Willard, Citizen
- 244. Joan Foster 4/, Housewife
- 245. Sue Bowman 5/, Citizen
- 246. Bob Weaver, Trout Unlimited, Colorado Council

- 1/ Charles Warner should be Charles Wanner
- 2/ Estella Leopold should be Robert Turner
- 3/ Jean Foster should be V. Crane Wright
- 4/ Joan Foster should be Joanne P. Foster
- 5/ Sue Bowman should be Sue Bollman

Reference No.

247. Carolyn Johnson, Mining Workshop, Colorado Open Space Council, Inc.
248. V. Crane Wright, Colorado Open Space Council
  2. Rock Springs, Wyoming, Outlaw Inn Motel, October 10, 1972
249. Teno Roncalio, U.S. Representative from Wyoming
250. Bruce Marker, Wyoming Department of Game and Fish
251. Marion E. Loomis, Wyoming Department of Economic Planning & Development
252. Mr. Patton for Wyoming U.S. Senator Clifford Hansen
253. Steve Majhanovich, Wyoming State Representative
  3. Cheyenne, Wyoming, Little America Motel, October 12, 1972
254. Stanley K. Hathaway, Governor of Wyoming
255. William J. Thompson, representing Senator Clifford P. Hansen of Wyoming
256. U. Dean Allred, on behalf of G. R. Schoonmaker Marathon Oil Company
257. John W. Hand, Mintech Corporation
  4. Vernal, Utah, Vernal Junior High School, October 12, 1972
258. Gordon Harmston, Department of Natural Resources
259. Howard Ritzma, Utah Geological Survey
260. Bert L. Angus, Uintah County Commission
261. Buell Bent, City Planning of Vernal
262. Glenn Cooper, Vernal Area Chamber of Commerce
263. Charles R. Henderson, Citizen, Uintah Basin, Utah

5. Salt Lake City, Utah, State Office Building,  
October 13, 1972

Reference No.

- 264. Wallace F. Bennett, U.S. Senator from the State of Utah  
(Letter read into the hearings record by James H. Day,  
Director, Office of Hearings and Appeals)
- 265. Paul Dougan, Equity Oil Company
- 266. Frank J. Allen, Western Oil Shale Corporation
- 267. Edwin J. Merrick, National Wildlife Federation
- 268. Midge Collins, Citizen, Provo, Utah
- 269. Leslie A. Jones, Citizen, Heber City, Utah
- 270. Harold Lamb, Utah Audubon Society
- 271. Louis H. Yardumian, Oil Shale Corporation
- 272. Max D. Eliason, Skyline Oil Co.
- 273. John Morgan, Jr., Utah Resources International Company
- 274. Cleon Feight, Division of Oil and Gas Conservation Board
- 275. Howard R. Ritzma, Utah Geological Survey

6. Grand Junction, Colorado, City Hall Auditorium  
October 13, 1972

- 276. R. W. Buchwald, Jr., Sun Oil Company
- 277. Frank Cooley, Oil Shale Regional Planning Commission
- 278. John R. Moran, Jr., American Petrofina Company of Texas
- 279. Russell J. Cameron, Cameron Engineers
- 280. J. W. Rogers, Aspen Pitkin County League of Women Voters  
and Grand Junction League of Women Voters
- 281. Bill Brennan, Board of County Commissioners in Rio Blanco  
County
- 282. Tam Scott, Colorado Rivers Council

Reference No.

- 283. Norman Allen, Colorado Sportsmen's Association
- 284. Diane Smith, Citizen
- 285. Joan Nice, Executive Committee of the Roaring Fork Group  
of the Sierra Club
- 286. James Smith, Jr., Citizen
- 287. Roland Fischer, Colorado River Water Conservation District
- 288. Gerald P. Wood, Colorado Department of Health
- 289. Gerald P. Wood, presenting Mr. Kirkpatrick's statement from  
the Colorado Air Pollution Control Commission
- 290. Ron Gitchell, Meeker Town Council and the Chamber of  
Commerce
- 291. Nyla Kladder, Audubon Society of Western Colorado
- 292. Ira J. Kowal, Citizen, statement read by Nyla Kladder
- 293. Bob Chancellor, Rio Blanco Natural Gas Company, speaking  
as an individual
- 294. Pat Halligan, Oil Planning Commission
- 295. Jack Roadifer, Citizen, Western Colorado

C. List of Hearings Exhibits and Of Other  
Supplemental Material Submitted

Reference No.

- C-1 Air Quality Implementation Plan for State of Colorado.  
Colorado Department of Health, Air Pollution Control  
Division, 4210 East Eleventh Avenue, Denver, Colorado  
80220 (1972).
- C-2 Bell Petroleum Company Petition for Decision and Brief in  
Support Thereof to Director, Bureau of Land Management.
- C-3 Clean Air Act, Sierra Club v. Ruckelshaus Civ. Action No. 1031-72  
(D.D.C. May 30, 1972). Submitted by Colorado  
Open Space Council, Inc., V. Crane Wright, President.
- C-4 Colorado Air Quality Control Regulations and Ambient Air Quality  
Standards. Colorado Air Pollution Control Commission,  
Colorado Department of Health, 4210 E. 11th Avenue, Denver,  
Colorado 80220 (1972).
- C-5 Considerations in Formulating a Rational Oil Shale Policy.  
Theodore J. Ellis, Assistant Professor of Economics,  
Adams State College, Alamosa, Colorado (1972). (Denver  
Exhibit No. 5).
- C-6 Energy Resources Map of Wyoming, Geological Survey of Wyoming,  
Dan Miller State Geologist, in Cooperation with the Wyoming  
Department of Economic Planning and Development, compiled  
by Donald W. Lane, Forrest K. Root, and Gary B. Glass (1972).
- C-7 Environmental Impact Statement; Notice of Public Hearing,  
Department of the Interior, Office of Hearings and Appeals,  
Federal Register, Vol. 37, No. 174, pp. 18098-9, Thursday,  
September 7, 1972. (Denver Exhibit No. 1).
- C-8 Environmental Inventory of a Portion of the Piceance Creek  
Basin in Rio Blanco County Colorado, prepared by the  
Environmental Resources Center, Colorado State University,  
Fort Collins, Colorado, for Cameron Engineers, Inc., Denver,  
Colorado, 327 pp., December 1971.
- C-9 Proposed Prototype Oil Shale Leasing Program, Written Comments,  
submitted by John S. Hutchins, Manager, Colony Development  
Operation, Atlantic Richfield Company, Operator The Oil  
Shale Corporation, November 1, 1972.



Reference No.

- C-10 Rules and Regulations Governing the Development and Production of Crude Oil and Gas from Bituminous Sandstone and Crude Shale Oil (Kerogen) from Oil Shale and Surface Land Reclamation Regulations Relating Thereto. Submitted by Cleon Feight, Division of Oil and Gas Conservation. (Salt Lake City Exhibit No. 5).
- C-11 Rules and Regulations Pertaining to Radiation Control. State of Colorado, Colorado State Board of Health, OR-RH (6-70-25), effective date July 1, 1970.
- C-12 Statement by Howard R. Ritzma, Committee on Environmental Problems of Oil Shale, State of Utah, to Oil Shale Task Force, U.S. Department of the Interior, Vernal, Utah, October 12, 1972. (Vernal Exhibit No. 1).
- C-13 Statement of Rio Blanco Natural Gas Company and Rio Verde Natural Gas Company, October 10, 1972.
- C-14 Statement by Russell J. Cameron, President, Cameron Engineers, Inc., Denver, Colorado for Presentation at Public Hearings on Draft Environmental Statement Concerning the Department of the Interior's Proposed Prototype Oil Shale Leasing Program, October 13, Grand Junction, Colorado. (Grand Junction, Colorado Exhibit No. 1).
- C-15 Skyline Oil Company, Annual Report, Fiscal Year ended May 31, 1972, 21 pp. (Salt Lake City Exhibit No. 1).
- C-16 Statement of Skyline Oil Company on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program. Max D. Eliason, 21 pp., Salt Lake City, Utah, October 13, 1972. (Salt Lake City Exhibit No. 2).
- C-17 Synthetic Pipeline Gas Potential from Green River Oil Shales of Uinta Basin, Utah. (Map) submitted by John Morgan, Jr., President of Utah Resources International Company, 709 Walker Bank Building, Salt Lake City, Utah. (Salt Lake City Exhibit No. 4).
- C-18 The Myth of So-Called, Mis-Named "Oil Shale". Maury M. Travis, Travis Research International, 6 pp., October 10, 1972. (Denver Exhibit No. 3).
- C-19 The Potential Role of Oil Shale in the U.S. Energy Mix: Questions of Development and Policy Formulation in an Environmental Age. Theodore J. Ellis, Ph.D Dissertation, Colorado State University, Fort Collins, Colorado 80521, September 1972. (Denver Exhibit No. 4).

Reference No.

- C-20 Total Oil in the Oil Shale, Uinta Basin, Utah. (Map) submitted by John Morgan, Jr., President of Resources International Company, 709 Walker Bank Building, Salt Lake City, Utah. (Salt Lake City Exhibit No. 3).
- C-21 Water Quality Standards and Stream Classification. Water Pollution Control Commission, Colorado Department of Health, September 1, 1971.
- C-22 Written Comments of the Oil Shale Corporation on the Draft Environmental Statement, Prototype Oil Shale Leasing Program. Submitted by the Oil Shale Corporation, 1600 Broadway, Denver, Colorado, November 6, 1972, 88 pp.
- C-23 An Interim Compilation of Sociometric Data on Garfield, Mesa and Rio Blanco Counties. Compiled by Norman Wengert, Ph.D., 1972.
- C-24 Impact on Air Quality from Oil Shale Development, prepared by Engineering-Science, Inc., 7903 Westpark Drive, McLean, Virginia, January 5, 1973.



LETTER NO. 1

## United States Department of the Interior

BUREAU OF INDIAN AFFAIRS  
WASHINGTON, D.C. 20242

IN REPLY REFER TO:

Real Estate Svcs.  
Minerals

OCT 31 1972

### Memorandum

To: Oil Shale Coordinator

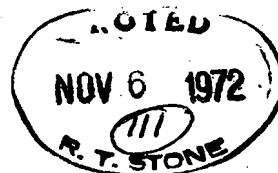
Through: Assistant Secretary, Public Land Management *EB* 11/2

From: Commissioner of Indian Affairs

Subject: Review of Draft Environmental Impact Statement  
for the Proposed Prototype Oil Shale Leasing  
Program (DES-72/89)

Pursuant to your memorandum of September 7, a review of the subject impact statement has been made. As a result thereof, the following comments are offered:

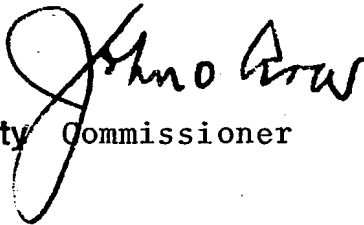
1. Our review of the subject draft environmental impact statement has not revealed areas of concern on property held in trust or restricted status under the jurisdiction of the Bureau of Indian Affairs.
2. On page 155, Volume II, in the discussion concerning slurry pipeline transportation of coal, reference is made to this type facility being used at Black Mesa, Arizona. No criticism is made of the factual statements presented; however, we feel that mention should be made of the water monitoring program being conducted as an integral part of the slurry pipeline-mining operation, since specific designation was made by name. At the top of page 156, it could also be stated that the Black Mesa slurry pipeline has incorporated most, if not all, of the recommended provisions to prevent damage to the environment.
3. The two paragraphs on page 190, Volume II, in the discussion of Magnetohydrodynamics seem to be in some degree of conflict. Some tying statement of clarification is needed.



4. The discussion of the potentials of wind energy, on page 195, Volume II, contains several references to the measurement of electric power generation. It is thought that the term "megawatt" here would be more easily understood by most people, since it has become a familiar term in the description and measurement of electric power generation capacity.

5. On page V-8, Volume III, Additional Royalties clause of the proposed lease form, provision is made for royalties to be paid on minerals other than shale oil produced from the leased land. However, the wording of this clause as constructed does not give a clear understanding as to what amount of royalty, if any, is to be paid on these other minerals subsequent to the twentieth year of the lease.

The effort necessary in attempting to write a statement covering all the foreseeable impacts on the environment which may be caused by a project of this size is recognized and complimented.

  
Deputy Commissioner



LETTER NO. 2

IN REPLY REFER TO:

United States Department of the Interior

1792 (220)

BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

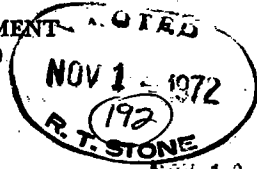
DES-72/89

Memorandum

To: Oil Shale Coordinator

From: Director, Bureau of Land Management

Subject: Draft Environmental Statement - Oil Shale



NOV 10 1972

The draft statement evaluates the environmental impacts associated with the Prototype Oil Shale Leasing Program. If this program expands primary and secondary impacts - chemical, physical, biological, social, their interrelationships will become more intensive. At this time it is difficult to evaluate the environmental impacts associated with oil shale mining in any given area since three different options are open. All of these options have their own individual impacts.

The following comments are provided by topic for your consideration.

Mining: The report deals primarily with the environmental problems associated with the prototype leasing and limited production and does not consider the impacts of full scale production. Auxiliary and back-up facilities, roads, power, pipelines, etc., required to support the primary action, and their impacts, have only been given passing treatment in the statement.

Vegetation: The statement indicates that vegetation of the area is predominantly of three major types: sagebrush, mountain shrubs, and Pinion-Juniper. These vegetative communities are important factors in other Bio communities, and once removed, they cannot readily be re-established. The statement does not explore this interrelationship.

Brush chaining operations for changing from a brush community to a grassland community are not comparable to revegetation of spent shale areas. The biological interrelationships are quite different.

The statement's coverage of vegetation of spent spoil sites is not conclusive. The statement reports that small areas of spent shale can be revegetated with certain plants, provided necessary amounts of water, topsoil and fertilizer are applied. Whether this is significant to re-establishment of native browse important to wildlife remains in doubt. Also, it is not clear whether any reestablished vegetation will survive without periodic applications of water fertilizer. On page I-25,

Vol. I, it is stated that "Moistening and compacting spent shale as a part of the disposal procedure can materially expedite the cementation phenomenon, resulting in a nearly impervious condition within a few days." This would seem to suggest that revegetation would require that the impervious layer be covered with topsoil and perhaps require supplemental water.

Vol. III, page V-70, indicates the lessee will be required to restore vegetation to disturbed areas, but can choose one of the three standards listed. This raises the question whether the standard of revegetation has a bearing on long-range land use plans and long-range environmental impacts on other uses and resources. Thus the statement needs to explore this aspect more fully to determine whether the land manager needs to be concerned with the choice.

Water Resource: The statement could be expanded to describe more fully this resource in relation to surface and subsurface supplies and quality. Presently the Green River has wild and scenic river potential and the project impact on this potential has not been explored, particularly the water quality aspect.

The draft statement does indicate water quality degradation will occur. There is no indication whether EPA and State criteria will be exceeded. The statement has not discussed the possibility of using exploratory wells mentioned in the statement for production of water in the project area provided they intercept productive aquifers. The impact of the water provided from these wells could result in benefits or adverse impacts, and could add to the evaluation of environmental impacts.

Recreation: Recreation throughout the statement receives only brief attention. The area's recreational capabilities are not fully explored. The statement does not deal with impacts on recreation and the natural environment associated with recreational values such as population influxes, mining activities, quality of experience, and increased access.

Socio-Economic: Socio-Economic impacts as related to the proposed statement are very general in nature. Demands on social services such as schools, police, fire protection waste disposal systems, water, housing, etc., are not explored. The existence of planning groups on national, regional and local levels does not necessarily mean that adequate steps will be taken to protect the environment before, during, and after the mining operation is completed.

Air Quality - Noise Levels: The interrelationships with the living and non-living resources are not discussed.

Wildlife Resources: Wildlife resources, terrestrial and aquatic, should be described more fully, including their interrelationships with the existing living and non-living components of the environment. A listing of the species in the area would be beneficial. The statement does not

show whether rare, endangered, or threatened species identified either on a national or state level are located in the area.

Primary and secondary effects on wildlife are not explored by the statement e.g., roads intersecting migration routes, destruction of key habitat, increased human disturbance, increases in air, water, noise, pollution, changes in the habitat, etc.

Alternatives: Biological Energy - This potential source of energy could be more fully explored. Instead of producing more waste, a significant problem on a national level, this process utilizes waste with 100 percent recovery (approximately 80 percent aliphatic oil for conversion to fuel and 20 percent residue). This residual ash, although sterile, has excellent soil building qualities. The 1.25 barrels of oil per ton of waste appears low. Improved technology reportedly has increased oil recovery to two barrels.

The final statement should be closely reviewed for accuracy and updating e.g., pages 85 and 89, first paragraph, should read: 5,000 hunters spent 40.8 thousand hunter days visiting the areas each year during the hunting season and harvested an average of 5,500 deer, etc.

*Burt Schuch*



# United States Department of the Interior

## BUREAU OF MINES

BUILDING 20, DENVER FEDERAL CENTER  
DENVER, COLORADO 80225

Office of  
Chief

Intermountain Field Operation Center

October 6, 1972

### Memorandum

To: Mr. Henry O. Ash, Deputy Oil Shale Coordinator,  
Oil Shale Task Force (Field), Room 237E, Building 56,  
Denver Federal Center, Denver, Colo. 80225

From: Chief, Intermountain Field Operation Center

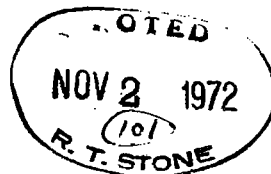
Subject: Review of Draft Environmental Statement prepared by the  
Department of the Interior for the Proposed Prototype  
Oil Shale Leasing Program

The draft environmental statement for the Proposed Prototype Oil Shale Leasing Program has been reviewed by personnel of the Intermountain Field Operation Center of the Bureau of Mines.

As we interpret it, the primary purpose of the proposed prototype program is to determine the feasibility of the utilization of oil shale, one of the Nation's most abundant energy resources. A great amount of study and research has been done on oil shale, but it is now evident that prototype development is needed if the future of an oil shale industry in the United States is to be satisfactorily evaluated.

The Department of the Interior proposes a leasing program that might lead to a production of 1 million barrels of shale oil per day by the year 1985. Six test leases--two each in the States of Colorado, Utah, and Wyoming--have been proposed for the prototype plan. The leases would include no more than 5,120 acres of land for each lease or a total of 30,720 acres for the combined leases.

The draft Environmental statement, although voluminous and somewhat repetitious, describes in detail the proposed action and its ramifications. An oil shale industry would have profound environmental impacts, particularly on regional water supplies and on alteration of the topography and the general appearance of the land used for permanent waste disposal. The assessment of environmental impacts, as presented in the environmental statement, is comprehensive.

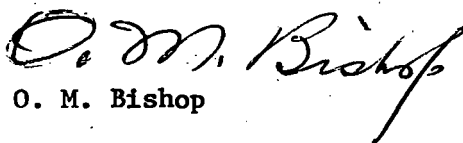




Seemingly, an extreme effort was made to present a factual concept of the overall environmental impact that would be caused by oil shale development. The detailed information needed to evaluate properly the environmental impact, however, must come from operations such as those proposed under the prototype leasing program.

A thorough investigation of oil shale as a new source of energy for the Nation is timely, and we believe the prototype leasing program to be the optimum means for such an investigation. This procedure would provide: (1) The background information needed to evaluate the economics of an oil shale industry, and (2) the detailed information needed to assess environmental impacts. Realization of such goals should be achieved through utilization of a relatively small aggregate amount of land in remote areas and thus without gravely adverse effects on the environment. Accordingly, the Intermountain Field Operation Center finds no objection to the project as described, and we have no significant suggestions for modifications in the draft environmental statement other than to recommend professional editing.

Our field-level comments are informal and are provided as a service; they do not constitute a formal review by the Bureau of Mines.

  
O. M. Bishop

LETTER NO. 4



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES  
WASHINGTON, D.C. 20240

SEP 18 1972

Memorandum

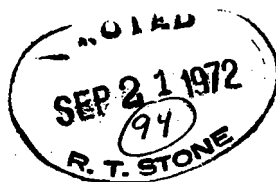
To : Oil Shale Coordinator  
Through: Assistant Secretary--Mineral Resources  
From : Director, Bureau of Mines  
Subject: Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program

*Spokefield 9-19-72*

This is in response to your memorandum of September 7, 1972, inviting comments concerning the subject Statement.

In view of the major involvement of the Bureau of Mines in preparation of this material, both at field and Washington Office levels, our obvious position at this time is one of endorsement. Following the period specified for submittal of comments, we shall be pleased to provide further assistance within our areas of knowledge in evaluating and resolving comments received from others, if such assistance is desired.

*[Signature]*  
Acting Director





## United States Department of the Interior

BUREAU OF OUTDOOR RECREATION  
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

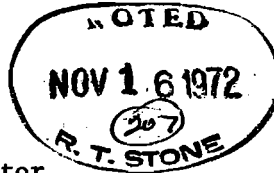
DES 72-89

Memorandum

To: Oil Shale Coordinator

From: Director, Bureau of Outdoor Recreation

Subject: Draft Environmental Statement - Oil Shale



NOV 15 1972

This is in reply to your memorandum of September 7, 1972, requesting our comments on the subject document.

Based upon our review of the document we feel that it is adequate in the areas of this Bureau's interest. As a total document we feel that it meets the requirements of the National Environmental Policy Act of 1969, Section 102(2)(C) for the prototype program. However, for a possible projected full-scale oil shale industry we feel that another environmental statement will be necessary, particularly for the sections on socio-economics and water.

For the current proposed prototype project we urge that information being derived from the joint studies being conducted by the State of Colorado and this Department be fully utilized to curtail all excessive adverse impacts described in the draft statement.

As stated in the document: "The quality and type of outdoor recreation, like most uses of the land are primarily controlled by the landscape and its attending components of soil, climate, relief, water, vegetation and wildlife." In order to maintain an acceptable quality for recreation and all other uses of the proposed area, the Department has determined that the project area will have a comprehensive rehabilitation program which is covered in detail in the draft statement. We urge that the primary method of rehabilitating the affected areas require the use of stockpiled soil material until the results of current studies mentioned above, and others, are at hand.

We appreciate the opportunity to review the complete document, as well as the opportunity to assist in its preparation.

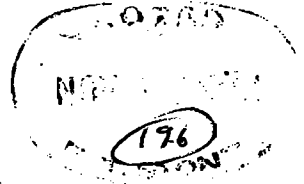
for James G. Watt  
Director



## United States Department of the Interior

BUREAU OF RECLAMATION  
WASHINGTON, D.C. 20240IN REPLY  
REFER TO: 739  
773.

NOV 22 1972



## Memorandum

To: Oil Shale Coordinator  
Through: Assistant Secretary - Water and Power Resources

From: Commissioner of Reclamation

Subject: Draft Environmental Statement for the Proposed Prototype  
Oil Shale Leasing Program

SJS  
11/22/72

This responds to your September 7 memorandum requesting comments on the subject draft environmental statement. Our comments follow: Summary, item 2 - We suggest including the time when the program will begin and its probable duration.

Introductory Note, paragraph 1, second sentence - It is stated that the "general purpose is a study of the environmental impacts of oil shale development." However, the environmental statement as such is not a study but rather an analysis of the probable impacts of oil shale development.

The statement does not sufficiently cover rare and endangered life species. Since nearly 125 square miles of land area may ultimately be affected, the total impact thereon as well as on the associated terrestrial and aquatic ecosystems should be more thoroughly evaluated and discussed.

The impacts of the proposed oil shale development on water resources are ponderous, yet only very general mention is made in the impacts section in Volume I of possible problems such as ground-water depletion and contamination.

In Volume I, Chapter II, possible sources of necessary project water are discussed. The discussion, however, covers sources which, in many

cases, are as yet undeveloped and unplanned. Later in Chapter III, consideration is given to use of ground water as a feasible source of project water. Some clarification is needed of the truly viable sources of water.

"Description of the Proposed Action" - The major problem of disposal of the processed shale is discussed in some detail. However, this discussion appears too limited for the complexity and magnitude of the problem. For example, there is discussion of removal of the mine tailings utilizing conventional disposal schemes, e.g., transporting wastes as slurry into ponds. The coal mining interests in the Eastern United States have utilized this practice for many years. We believe that alternative systems of surface disposal which have fewer adverse impacts than these hydraulically placed valley fills should be considered.

A possible approach would be (1) to draw more fully from experience and technology of earth-embankment design and construction in the transportation and placement of the waste; and (2) to avoid drainage courses with the plan to fill the valleys and instead design the disposal areas as topographic benches, terraces, or mesa-like hills (as stable erosion-resistant features) that would better harmonize with the natural landscape.

We feel the statement does not include an adequate discussion of the alternatives from both an economic and environmental viewpoint. For example, in Volume II, where the broad treatment of energy requirements is analyzed, there are little economic data presented to compare the amount of capital that would be required for the various alternatives.

The probable environmental impacts resulting from the various alternatives in Volume II are too broad and general to assess the relative magnitude of the impact in each case. Therefore, the reviewer and, ultimately, the decision-maker have insufficient economic and environmental information on which to base a decision.

Also, it is difficult to assess probable local environmental impacts resulting from individual leases, as discussed in Volume III. For example, there is a listing of the acres of land required for roads, size of the pits, plant facilities, and shale disposal areas. However, how this fits into the landscape in the local area is not clearly defined. Perhaps the use of maps with overlays would be useful in delineating the extent of impact and where it fits in regard to the local areas.

On page 181, Volume II, the discussion of electrical transmission lines refers to improved fire protection resulting from clearing the rights-of-way, and goes on to say: "Disturbance of the terrain is minimal except for clearing trees and brush. However, some unresolved questions exist concerning the effects on wildlife migration and surface erosion." The writer evidently has the older concept of "clear-cutting" transmission line rights-of-way in mind. Current Bureau practice is to leave trees and bushes in place where at all possible, removing only those danger trees which might fall into the transmission lines. The practice of leaving low trees and bushes on the right-of-way reduces the visual impact of the transmission line on the landscape and controls erosion to a much greater degree than was possible with the earlier clear-cutting practice.

The alternative section should include the alternative of "no development."

Other specific comments follow:

#### VOLUME I

Page II-72, line 9, should read "Jacket or Rio Blanco or Sweetbriar sites could yield as much . . . ." Line 19, "DeBewue" should be "Debeque."

Page II-74, line 6, "2,758,000" should be "2,749,000."

Page II-159, line 7, Rock Springs is not the county seat.

Page II-160, line 6, "300,000" should be "1,500,000."

#### VOLUME III

Page II-30, line 16, "RUCHI" should be "Ruedi."

A handwritten signature in dark ink, appearing to read "DeBewue" or similar, written in a cursive style.



LETTER NO. 6a

ADDRESS ONLY THE DIRECTOR,  
BUREAU OF SPORT FISHERIES  
AND WILDLIFE

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

WASHINGTON, D.C. 20240

NOV 21 1972

### Memorandum

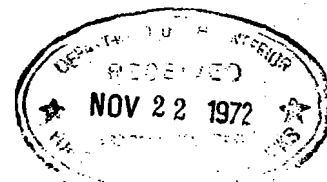
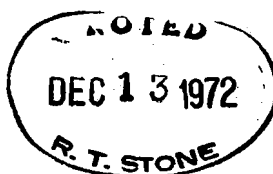
To: Oil Shale Coordinator  
Through: Assistant Secretary for Fish and Wildlife  
and Parks  
Deputy  
From: Director, Bureau of Sport Fisheries and Wildlife  
Subject: Review of Draft Environmental Statement for the  
Proposed Prototype Oil Shale Leasing Program  
(DES-72/89)

*Noted for FWP  
RR 11-22-72*

The subject draft environmental statement was reviewed as requested in your memorandum of September 7, 1972.

This Bureau has actively participated in the preparation of the draft environmental statement and is also participating in work on the final statement. Our input is reflected in the environmental statement. We, therefore, have no further comments at this time.

*D.V. Schmidt*



## ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

DEC 5 1972

OFFICE OF THE  
ADMINISTRATOR

Mr. Reid Stone  
Oil Shale Coordinator  
U.S. Department of the Interior  
Washington, D.C. 20240

Dear Mr. Stone:

The Environmental Protection Agency has reviewed the draft environmental statement for the Proposed Prototype Oil Shale Leasing Program. We have enclosed our detailed comments which we hope will be useful in the preparation of the final impact statement on this action.

The draft statement does a commendable job of addressing the environmental effects of oil shale development. We believe, however, that the final impact statement should provide additional information in the following areas:

- ° Impact of the program on water quality and availability as well as on air quality.
- ° Environmental problems associated with the disposal of spent shale.
- ° The future role of the Field Oil Shale Task Force and the general public in the review of mining development plans and special land use permits.

In addition, we have included some suggestions regarding future research which we believe should be conducted in connection with the prototype program. We have also recommended that the Department of the Interior prepare further environmental analyses before the approval of the mining development plans or special land use permits, and we are requesting that the responsible Department of the Interior official confer with the Regional Administrator of EPA, Region VIII, prior to the approval of these documents.



We are looking forward to actively participating in the development of this program and are prepared to be of assistance in your efforts to implement the program with maximum environmental protection.

Thank you for your cooperation.

Sincerely yours,

A handwritten signature in cursive script that reads "Sheldon Meyers".

Sheldon Meyers  
Director  
Office of Federal Activities

## General Comments

We have reviewed the Department of the Interior's draft environmental impact statement for the Proposed Prototype Oil Shale Leasing Program. The statement does a commendable job of addressing many of the environmental effects of oil shale development, and we must consider this statement to be one of the most comprehensive we have reviewed. Our major concerns for more information are outlined below for your consideration.

1. The final statement should define as specifically as possible the decision-making process through which the Interior Department will evaluate the results of the prototype program to determine whether further Federal Oil Shale Leasing is warranted. One of the objectives of the proposed prototype program is to generate information on the environmental impact of commercial oil shale development and to utilize this information in deciding whether or not to proceed with additional leasing of Federal oil shale lands. However, it is unclear from the statement when this critical evaluation will take place.

The statement indicates on page I-III-3 that "the industry cannot develop beyond the 1 million barrel level without additional public lands" and that "additional public lands will not be offered for development without a thorough review of the expected impact as compared to the actual impact." We infer from this discussion that there will be a moratorium on further leasing of Federal oil shale lands until:

a. it is determined that a commercial industry is established.

b. a thorough evaluation of the prototype programs is completed.

The final statement should indicate whether this inference is correct, and, if not, specify how the Interior Department plans to evaluate the prototype program.

The final statement must make it very clear to both the general public and industry that approval of the prototype program does not represent approval of future large scale leasing of Federal oil shale lands. It must be emphasized that future leasing of Federal oil shale lands will only take place after a comprehensive, systematic, interdisciplinary evaluation of the economic, social and environmental impact of the prototype program.

2. Other programs for natural resources development in the Colorado River Basin are presently being considered by the Department of the Interior (DOI); Southwest Energy Study, Geothermal Leasing Program, North Central Power Study. Since the environmental effects of all resources development are likely to be highly aggregative in their effects within the Colorado River Basin, we suggest that the final impact statement, to the extent possible, include an integrated evaluation of the cumulative and synergistic environmental effects resulting from this and other approved developments on public lands.

3. The development of a comprehensive policy on resources and energy is seen by many as the best way to deal with the problem of energy supply and demand and with the problem of developing energy resources in an environmentally sound manner. While we recognize that the Department of the Interior is not responsible for the development of such a policy, we feel that it would be valuable in evaluating proposals such as the oil shale program. The final statement should also discuss whether or not development of oil shale encourages continued dependence on fossil fuels. If the oil shale program forecloses the accelerated development of alternative energy sources, this should also be discussed.

4. Public involvement in the oil shale program to date (in addition to review of the draft statement and the October 1972 public hearing) should be discussed in the final statement. Plans for continued public involvement should also be addressed.

5. The economics of reuse of mining materials and spent oil shale should be continuously monitored.

6. The statement should include a short discussion on the extraction ratio, its relationship to the total estimated resource in place, and the objective of Interior to discourage "high-grading." Such a discussion would help to explain the difference between the 75% Anvil Points extraction ratio (I-I-7) and the assumed extraction ratio of 50-60% on page I-I-56.

7. The lease and applicable regulations indicate that the mining supervisor is responsible for overseeing lease operations and enforcing lease stipulations. The final statement should include a discussion of the role of the Field Oil Shale Task Force and EPA in assisting and advising the mining supervisor in the performance of his functions. In addition, the lease provisions should indicate that EPA and other appropriate Federal personnel may be allowed access to oil shale development lands for the purposes of establishing compliance with air and water quality standards. Since the lease provisions and existing Federal regulations establish the Mining Supervisor as an "environmental ombudsman," it may be well to consider amending these stipulations and providing for the establishment of an independent advisory board, composed of qualified representatives of responsible governmental organizations, and possibly of environmental organizations and the general public, for the purpose of advising the Mining Supervisor on environmental matters requiring a multidisciplinary approach.

#### Water Availability and Requirements

##### I. General Comments

Although the draft environmental statement indicates that water availability is a major constraint applied to any oil shale industry, we feel that the final statement should indicate in detail the amount of uncommitted excess water currently available to supply the oil shale

industry, and the current distribution of water by municipal, industrial, agricultural, or other classifications in the Upper Colorado River Basin areas of Colorado, Utah, and Wyoming.

The final statement would be strengthened by including an analysis of the broad picture of projected water uses by the oil shale industry and its related developments. The requirements of industrial and support services, including power generation and municipal uses, should be quantified to the fullest extent possible. Additionally, forecasts should be made for expected water uses if the oil shale industry develops beyond the prototype stages. The need for detailed analyses of water use and availability in this semi-arid region cannot be overemphasized.

The final statement should address the impacts associated with any extensive water use, as the potential for environmental degradation is quite real. The statement must clearly indicate that water withdrawn from the upper Colorado River Basin will be of a high quality and that the diversion of this water for oil shale use, either directly, or by means of water resources development projects such as the Yellow Jacket Dam, will cause a decrease in downstream water quantity and quality. Such diversions will affect beneficial downstream water uses in the United States and Mexico.

If either the prototype or the full scale development of the oil shale industry and its related water requirements will result in less water available for irrigation or other uses in the basin,

this should be discussed in detail in the final statement. Environmental impacts of long-term water resources developments on the Colorado River Basin or other areas should also receive more detailed consideration. In short, the draft statement indicates that an oil shale industry will require substantial amounts of water for its development, and we believe more detailed analysis of the environmental effects of water should be presented in the final environmental impact statement. The tradeoffs associated with the development of water resources to serve this industry should be clearly presented in relationship to competing demands for water.

## II. Specific Comments

### A. Water Requirements of the Oil Shale Industry

Water requirements for the development of an oil shale industry have been the subject of discussion in the literature for many years. Beyond data presented in the environmental statement, sources consulted indicate that the basic water needs for the industry are still subject to highly variable estimates, especially if the related water needs of off-site developments are considered. We suggest that the final statement clearly indicate the extent of this unknown, and present an analysis of the environmental impact to be expected if sufficient supplies of ground water are not available, resulting in extensive surface water withdrawals and resultant damages to downstream beneficial uses of Colorado River water. Pertinent data regarding variable estimates of water needs

are summarized below.

<u>Source of Information</u>	<u>Water Required As stated in Source of Information</u>	<u>Calculated Water Required by a 1 mil Bbl/Day Oil Shale Development</u>
1. Water for Oil Shale Development by Robert Delaney, 43 Denver Law Journal, 72 (1966)	This article cited 1953 State financed study under the direction of the Colo. Water Conservation Board, indicating that a 2 million barrel per day operation would require 455,000 acre ft. of water per year.	227,500 Ac. ft. per year.
2. Same source as No. 1	"... for each individual directly engaged in the oil shale industry there will be five persons resident in the area." "... one-fourth.. acre ft. of water per year per person..." Cites a figure by the Mineral Resource Board of 340,000 people in the area with 59,130 directly employed.	85,000 Ac. Ft.
3. Same as No.1	Sum of No. 1 & 2 above	312,500 Ac. Ft. per year.
4. Feasibility Report Yellow Jacket Project, Colorado April 1972	The estimate here suggests that for a 2 billion barrel annual production rate, 600,000 Ac. Ft. of water must be diverted.	73,000 Ac. Ft. per year.
5. Estimates Based on Values Presented in the Environmental Impact Statement.		
a. Situation 1-Surface Disposal	Process water requirements of 120 gals per barrel. Water requirements for surface disposal of spent shale, 65 gals per barrel. Maximum irrigation requirement, 75 gals per barrel and	328,000 Ac. Ft. per year.



<u>Source of Information</u>	<u>Water Required As stated in Source of Information</u>	<u>Calculated Water Required by a 1 mil Bbl/Day Oil Shale Development</u>
5. a. Situation 1- Surface Disposal	water requirements to upgrade shale oil, 30 gals per barrel for a total of 290 gals per barrel.	
b. Situation 2- Mine Disposal	120 gals per barrel processed water requirements. Water required to return the spent shale to the mine, 240 gals per barrel and water requirements for shale oil upgrading, 30 gals per barrel for a total of 240 to 390 gals per barrel.	280,000 to 435,000 Ac. Ft. per yr with 0 to 291,000 Ac. Ft. per yr produced from the mine.

It is significant to note that only two of the above figures include any provision for population development accompanying the development of the oil shale industry. This issue is critical to a complete discussion of the environmental impact of oil shale development. Considering this aspect of the problem it seems reasonable to assume that at least 312,500 Ac. Ft. of water per year would be required (#3 above) and perhaps as much as 413,000 Ac. Ft. per year. (#2 + #5a)

We feel that the final environmental statement should attempt to resolve the above-noted discrepancies in estimating water requirements, and, in the absence of detailed mining and development plans, present a more detailed analysis of the total water needs for all oil shale and related developments. In particular, there is a need to separate discussions of consumptive and non-consumptive uses of surface waters, and to more fully address the questions surrounding supplemental ground water availability.

## B. Water Availability

It is reasonably easy to estimate the water available to the Colorado River Basin portion of the State of Colorado (where it is presumed that the major oil shale activity will occur due to favorable deposits of oil shale) by referring to various treaties, compacts and court cases that have allocated water in the Colorado River Basin. The rather straight forward calculation below will easily point out the water available for distribution within the State of Colorado that originates in the Colorado River Basin. However, it becomes extremely difficult to trace the current uses of this water within the State of Colorado.

### Water Available to the State of Colorado

	<u>Acre Feet</u>
1914 to 1965 typical flow- Upper Colorado River Basin	14,872,000*
Amount Obligated to the lower basin- Colorado River Compact	7,500,000
Amount Remaining	7,372,000
Upper basin spills - result of previous years' experience (1966-1967)	913,000*
Amount Remaining	6,459,000
Arizona Allocation	50,000
Amount Remaining	6,409,000
Colorado entitled to 51.75% of 6,409,000	3,316,650
Mexican Treaty obligation 51.75% one-half of 1,500,000 acre feet	388,000
Grand Total Remaining Available to Colorado Ac. Ft./Yr.	2,928,650

\* Obtained from Office, Colorado State Water Engineer

This calculation appears to be quite rigid and represents a maximum of water available to Colorado. In actuality, less water may be available to Colorado than is indicated here due to the fact that the 7,500,000 acre feet per year of water allocated to the lower basin is actually 75,000,000 acre feet in each ten-year period and has apparently not been met in some 10-year periods, thereby indicating a water shortage.

The question then remains, what is the current division of this 2,928,650 acre feet of water in the State of Colorado? It would theoretically be possible to trace water rights as they exist in the Colorado Basin of Colorado. For example, the notice of tabulation of decreed water rights obtained from the Colorado State Water Engineers' office shows 4,524 adjudicated water rights in the Colorado River Basin. The earliest of these rights go back to 1860 and the latest somewhere in the vicinity of 1966. Unfortunately, it becomes nearly impossible to trace and determine the current owner of most of these rights. It is apparent, however, that developers of the oil shale resource realize that, without adequate water an investment in oil shale itself is of no value; therefore, it seems reasonably safe to assume that oil companies have purchased water rights, and, indeed some of these water rights do appear in the notice of tabulation of decreed water rights. Considering the semi-arid nature of the area, however, and the potentials that exist for large water withdrawals, we feel that water rights available for oil shale production and related developments should be enumerated in detail in the final statement.

In summary, it is impossible to compare the water required against the water available. The final statement should clearly indicate that if the decision is made to proceed with oil shale development all development that might have otherwise occurred in the Colorado River Basin may be precluded due to a possible shortage of water. Clearly, the number of obligations to lower Basin states and to the Republic of Mexico fully limit the water available to the State of Colorado (and apparently less critically to the States of Wyoming and Utah). There appears to be little or no slack in the system as annual production in the basin can be accurately predicted, and, to aggravate the situation, the division of water between the upper and lower basin states was predicated on an amount of water in excess of that produced since the division. In addition, the Republic of Mexico is currently involved in negotiation with the United States in an attempt to lower the salinity of water delivered to them under the treaty governing this delivery. More water from the upper basin may be needed for this purpose, thus further limiting amounts available for oil shale development.

It appears from the above data that as much as 413,000 Ac. Ft. of water per year may be needed for the oil shale industry while 2,928,650 Ac. Ft. of water per year are available to Colorado for all purposes, both old and new. To intelligently discuss the environmental impact of oil shale development, more information must be provided in the final statement so that these two values may be compared.

## Water Quality

### I. General Comments

The draft environmental statement recognizes that serious water quality problems may result from the development of the oil shale program. Included are effects of spent shale pile leachates, including heavy metals; withdrawals of large amounts of surface waters, resulting in downstream increases in salinity; waste waters from retorting and upgrading facilities; and waste waters generated from oil shale industry support developments. Our concern is that more data are needed to predict the water quality problems in greater detail, and subsequently to discuss the adverse environmental impacts, and that the discussions of water quality found in the draft statement do not fully consider the ultimate effects of water quality deterioration. In particular, the statement should recognize the fact that oil shale development is but one of many projects planned for development in the Rocky Mountain states that will contribute to long-term degradation of water quality. Although it would be useful for the Department of Interior to compile extensive data comparing the relative water quality problems associated with all proposed developments in this area, we feel that a general perspective could be developed concerning the relative severity of water quality problems associated with the development of the oil shale resource. Such an analysis may prove useful in the final evaluation of environmental factors for oil shale development.

### II. Salinity Increases

The draft environmental statement properly recognizes that extensive

withdrawals of surface waters in the Upper Colorado River Basin will result in salinity increases in the downstream reaches of the river. The final statement must make it very clear, however, that the precise amount of increase will not be known until detailed plans for the development of the water resources of the area are available. Additionally, the final statement should express all possible salinity increases in terms of a million Bbl/day shale oil industry, and dollar damages expected as a result of salinity increase should be quoted. The following information should be included in the final statement:

Water Depletion (Acre-ft/yr)	Expected Salinity Increase*	Annual Penalty Cost (1972)	Reference
79,000	4	278,000	
124,000	7	\$ 473,000	I-III-39
105,000	8	528,000	I-III-39
156,000	12	806,000	
312,500	19	1,279,000	EPA Comments
413,000	26	1,737,000	on draft EIS (Page 9)

\*Calculated effect at Hoover Dam; assumes depletion from White River Basin

The above table indicates what we feel is the probable range of water withdrawals and related salinity increase. Actual values are certainly undeterminable at the present time, and may vary considerably depending on process needs, population increase, ground water withdrawals, and related surface water resource developments. The final statement should indicate how damages caused by salinity increase will be compensated.

The discussion of salinity increases should be expanded to include an analysis of what the ultimate effects of the salinity increases will be. Specifically, the statement should examine the long-term effects of the increases on ecological systems such as aquatic biota (including fishery resources), recreational values, irrigable lands, and water supply systems. If the expected salinity increase may conflict with salinity negotiations underway with Mexico, the statement should clearly indicate this also. Since these impacts would appear to be unavoidable if the oil shale industry develops to a substantial size, they should be enumerated in detail under the section "Adverse Effects Which Cannot be Avoided." If steps could be taken to reduce salinity contributions from natural sources elsewhere in the basin, these should be discussed as mitigative measures.

### III. Water Quality Standards

The Seventh Session of the Conference on the Pollution of the Interstate Waters of the Colorado River and its Tributaries concluded that a salinity policy be adopted by the Colorado River system that would have as its objective the maintenance of salinity concentrations at or below levels presently found in the lower main stem. The final environmental statement should address this policy in some detail, and describe how the development of the oil shale resource may conflict with this policy, with special attention given to the basinwide aspects of the salinity problem. In any case, the final statement should more clearly indicate that oil shale development may violate the antidegradation statements of the approved water quality standards for the states of Colorado, Wyoming, and Utah. (See III-IV-18). The final EIS should

specifically discuss possible discharges of toxic substances and measures designed to prevent violation of the toxic substances criteria of the several states and drinking water standards of the U.S. Public Health Service. The statement should discuss the environmental impact of the violations in some detail.

#### IV. Spills of Oil and Hazardous Materials (See also comments on the Oil Shale Lease)

On pages I-62 through I-65 of Volume I, it is estimated that the average accidental release of oil from 150 miles of required pipeline would be one barrel per year. Figures from EPA's Oil Spill Coordinator in Denver suggest that in excess of 75,000 barrels of oil are reported as spilled in the six-State Rocky Mountain-Prairie Region (Colorado, Montana, North Dakota, Wyoming and Utah) each year, of which as much as 50 percent is from pipelines. Technological advances in pipeline construction and operation may reduce spills, but the above figures indicate a spill potential of up to 100 barrels per year. These values should be expressed as a range in the final EIS. There is also the possibility that oil would be carried by tank truck in which case the estimated annual spillage would be higher, according to our records.

Oil spills from pipelines may occur with greater frequency and damage to the environment than is stated in the draft statement. Spill data used in the preparation of the draft environmental statement were compiled from the records of the Department of Transportation's Office of Pipeline Safety. EPA statistics indicate that, in the months of September through December of 1971, pipeline failures accounted for



30-40% of total oil spills. By volume for these months, the percentage of pipeline spillage of the total spillage volume is even greater (35-50%). Spills may also result from other causes, including human error. The final statement should discuss these statistics and indicate that any oil spill will cause environmental degradation, and that pipeline failure data should relate to problems of water pollution control and water quality management, as well as safety considerations. Additionally, the phrase on page III-44 of Volume I, "average loss of oil from pipelines," should be changes to indicate concern stemming from frequency of oil spills as well as volume of oil released to the environment.

The draft statement indicates that the annual tonnage of chemicals to be discarded within the spent shale pile is extremely small. In terms of environmental impact, however, the potential harm that could result from chemicals in water runoff, including heavy metals, is not extremely small because a bioaccumulative material is measured in parts per billion, rather than tons per year. The final statement should clarify this section, and an attempt should be made to analyze the effects of any such discharges on the biosphere.

## Air Quality

### I. General Comments

The draft environmental statement for the proposed prototype oil shale leasing program generally addresses adverse affects on air quality resulting from oil shale development. However, the draft statement does not provide sufficient technical information to comprehensively evaluate the environmental impact on ambient air in the 6 sites selected for oil

shale development. It is our opinion that each phase of the development program does pose a potential for polluting the ambient air with either particulates and ash or gases.

Direct and indirect effects of air pollutants produced from the oil shale industry should be thoroughly discussed in the final statement.

Since some of the site areas are located in valleys and canyons, meteorological conditions, such as frequency of inversions and air mass stagnation, are extremely important to pollutant transport. Airshed models should be developed at the earliest possible date.

The impact of cumulative pollutant loading on ambient air, as stated in the draft statement (I-III-52) "cannot be determined with available data." However, long-term effects of pollutant emissions in the oil shale development areas can be qualitatively assessed by knowing some of the physical and chemical properties of the expected pollutants.

The draft statement indicates essentially that there will be a reduction of the "average annual visibility," and that inversion conditions in the Colorado River Basin aggravate effects on the public. This topic should be explored in detail and quantified where possible by compiling pertinent atmospheric, ambient air quality, and meteorological data.

The draft statement points out that thermal inversions over the area are frequent and "wherever feasible, processing facilities should be located on upland surfaces rather than in valleys and canyons." (Vol I, pg. III-53). Criteria for the determination of "feasible" in

the sentence above should be documented in the final statement. This information may be important in locating processing facilities for the prototype program and would be extremely useful if larger scale operations are ever developed.

It appears from the physiography descriptions of the 6 sites that "upland locations" for plant sites are feasible on all tracts. However, the perspective drawing, Figure III-2, Volume III, page III-4, illustrates that the facility is located in the lowest portions of a narrow valley where pollutants will be trapped on well over 50% of the nights. If the facilities were placed, for example, on the broad ridge of Tract C-a, inversions might trap pollutants only 15% of the nights.

The draft statement does not consider potential air pollutant effects including the possibility of fumigation of valley walls, on vegetation and wildlife native to the oil shale region. Information on these short and long-term effects should be documented in the final impact statement.

The proposed air quality monitoring program described in Volume I, page I-69, is not comprehensive enough to provide the background air quality data needed for a detailed analysis of the environmental impact of oil shale development. It is assumed that the monitoring plan submitted as part of the mining plan will detail the monitoring system and how air quality data will be used in conjunction with meteorological data for the determination of pollutant dispersion potentials in the oil shale leasing areas.

Under the section entitled Adverse Effects Which Cannot Be Avoided, it is indicated that air contamination effects can only be partially avoided. This section of the impact statement could be expanded to

specifically document all the effects of air pollutants expected to be generated from oil shale industry. The "residuals" referred to as being quantified in Chapter IV of Volume III are not characterized in sufficient detail for an evaluation of their impact on the environment. The oil shale leasing program will have a degrading effect on air quality in the immediate area of development. The cumulative effect on the environment of sulfur dioxide and  $\text{NO}_x$  emissions from many sources should be fully evaluated in the final statement.

## II. Particulate Emissions

The impact on air quality (I-III-C) presents limited information on particulate and gaseous emissions expected during process operations for oil shale development. Specifically, the statement indicates that "particulate matter and dust will be significant only in mine development" (I-III-46). In our opinion, this statement may be misleading and not technically correct. Particulate emissions may be expected from rock crushing and sizing operations, reentrainment of dust at disposal areas, conveying operations, and those resulting from traffic in the area. All potential sources of particulate emissions must be dealt with and controlled effectively.

The statement indicates that collected particulate material will be placed in disposal areas while wet, but does not consider the impact of loss of water by evaporation and subsequent particulate reentrainment into the atmosphere. This impact should be treated quantitatively in the final impact statement.

Mine ventilation air is a potential source of air pollution. This source would emit about 20 pounds of particulate matter per hour, except during blasting operations when emission rates of 60 pounds per hour may be observed. The environmental statement indicates that these emissions could be controlled by water sprays.

Treatment to recover the maximum amount of oil from oil shale would prevent particulate matter emissions from becoming an air pollution problem during retorting operations. Therefore, it is unlikely that additional regulations would be required to limit particulate matter emissions from retorting operations.

### III. Gaseous Emissions

Sulfur dioxide and  $\text{NO}_x$  emissions from retorting operations could be significant. Retorting operations produce a gas that can be burned to provide either heat or electric power for plant operations. Hydrogen sulfide is present in the gas and when the gas is burned sulfur dioxide is produced. The sulfur dioxide emission rate is a function of the type of retorting process employed. The internal combustion retorting process produces a gas stream that, when burned, would emit about two pounds of sulfur dioxide per million Btu fired. If all the gas is fired without the pretreatment indicated on page I-III-48, the uncontrolled sulfur dioxide emission rate for each retort would be: 404 pounds per hour\* from an internal

\* Assumes 97 million standard cubic feet of gas/day and 100 Btu/scf for each retort.

combustion retort; and 2,476 pounds per hour\*\* from an indirectly-heated retort.

Present emission regulations in Utah and Wyoming would not limit these uncontrolled emissions; however, the Colorado sulfur dioxide emission regulations would limit sulfur dioxide emissions to 417 pounds per hour. The environmental statement indicates that about 12 retorts would be used at each site; therefore, the total sulfur dioxide emissions from a 12 retort complex located in Utah or Wyoming could be: 4,848 pounds per hour (58 tons/day) for internal combustion retorts; and 59,424 pounds per hour (713 tons/day) for indirect heating retorts. The potential sulfur dioxide emissions from a 12 retort complex located in Colorado could be: 4,848 pounds per hour (58 tons/day) for internal combustion retorts; and 5,004 pounds per hour (60 tons/day) for indirect heating retorts.

The in-situ retorting process produces gas that has a low Btu heat content. This gas would not be burned to produce heat or electric power but rather would be flared. The sulfur dioxide emissions would be approximately 5.6 pounds per million Btu fired. If all the gas produced from a 50,000 barrels of oil/day operation is flared, the uncontrolled sulfur dioxide emission rate for a 100 well in-situ operation would be 10,395 pounds per day.\*\*\*

\*\* Assumes 7.67 million standard cubic feet of gas/day and 775 Btu/scf for each retort.

\*\*\* Assumes 1485 million standard cubic feet of gas/day/100 wells and a heat value of 30 Btu/scf.

Present emission regulations in Utah, Wyoming and Colorado would not limit sulfur dioxide emissions from an in-situ operation. Colorado sulfur dioxide emission limitations would not limit the emissions because of the nature of an in-situ operation; and, the form of the regulations. An in-situ operation would have about 100 wells producing gas and oil in operation at any one time and the sulfur dioxide emission rate from each well would be less than the maximum emission rate allowed from a single source under Colorado regulations. Therefore, an in-situ operation may produce large quantities of sulfur dioxide emissions from a relatively small geographical area. Controls will be required if the national secondary sulfur dioxide air quality standards are exceeded by the above emission rates. Each State Air Implementation Plan requires that the State Air Pollution Control Agency determine if the emissions from a new facility will interfere with the maintenance of the national standards. If the agency determines that the air quality standards would be exceeded, the State would have two courses of action. The State could set specific emission limitations for each facility or the State could prevent construction of specific facilities. Therefore, if each State can correctly determine the amount and type of control that is necessary, the national secondary sulfur dioxide air quality standards can be maintained.

Oil refinery operations and electric power plants are other potential sources of air pollution. The environmental statement indicates that if the conventional Claus process was used to recover sulfur from refinery gases, sulfur dioxide in the process tail gas

would correspond to an emission rate of about 750 pounds per hour. If power plants are built, large amounts of particulate matter, sulfur dioxide, and nitrogen oxides could be emitted. However, each new power plant would be subject to 40 CFR 60 Subpart D which sets standards of performance for fossil-fuel fired steam generators, and the rate of pollutant discharge would be limited.

The statement indicates on page I-III-48 that the sulfur standard for fossil-fuel fired steam generators is 0.6 lb/million Btu. This is the sulfur standard if solid fossil fuel is burned. If liquid or gaseous fossil fuels are burned as is likely in power plants associated with oil shale development, the sulfur standard is 0.4 lb/million Btu (40 CFR 60.43). It should be noted that these sulfur standards only apply to fossil fuel-fired steam generating units of more than 250 million Btu/hour heat input.

The draft statement does not consider the gaseous pollutant emissions that may present problems in spent shale disposal areas. It is unlikely that 100 percent of the volatile hydrocarbons and sulfur compounds will be extracted from the shale during processing. Some of these residual compounds may become significant air pollutants when they are disposed of in large piles within canyons. This impact should be treated in full in the final statement.

Despite the fact that the chemistry of  $\text{NO}_x$  formation is not completely understood, control methods and specific design data should be described in the final statement. The mining plan should identify specific sources of  $\text{NO}_x$  and the expected rates of emission



data provided, along with the specific control technology to be employed and expected efficiency of the equipment, gas temperatures, and gas volumes expected at each site.

#### Disposal of Spent Shale

1. As the statement indicates, all mining and retorting processes except the in-situ method will produce vast quantities of "spent shale." Inasmuch as the physical, and, to a degree, the chemical characteristics of the spent shale are largely functions of the retorting method, it is not possible to define what waste material will be produced. The environmental problems encountered in disposing of an ash-like material as opposed to a product of pebble size or larger are quite different, and the hydrophobic nature of material from the TOSCO retort behaves differently in the presence of water. Thus, retort waste stabilization may require a variety of disposal and compaction treatment techniques. If material of pebble size or larger is produced, it is possible that the shale would be crushed before being transported for ultimate disposal. There are major questions, however, as to the properties of such crushed shale, especially whether or not it would be amenable to the same stabilization techniques as shale ash.

2. The final statement should stress more fully the desirability of returning most spent shale to the mines (p. 143, Volume II) to, in turn, prevent subsidence and to minimize the off-site disposal of spent shale (pp. IV-8-9, Volume I). The tendency of the spent shales to become compacted has not been adequately reconciled with the necessity to provide permeability in the surface layers of the spent

shale to, in turn, allow vegetation to grow (see also pp. III, 43-44. V, 1-2, Volume I). Nor has the potential of spent shale to experience an increase in permeability related to freeze and thaw cycles or periods of snowfall been recognized. Salinity increases and releases of toxic heavy metals from such valley fills would be unacceptable.

3. Most disposal schemes for spent shale, in any form, seem to be dependent upon revegetation. We question whether the revegetation which has been achieved under very controlled conditions using fertilizer and irrigation can be extrapolated to very large areas. Work to date on spent ash has shown a decided margin of success in revegetation on the spent material being covered by two feet of natural soil and rock material uncontaminated with spent ash. So far the effect of rodents, lagomorphs, and larger ruminants on vegetative vigor, reproduction, and slope stability has not been explored despite the fact that these will be major factors in the success or failure of spoil revegetation.

4. We are concerned that the disposal sites for the disposal of spent shale cannot be specifically determined at this point, though general disposal areas are indicated in the draft statement. It will be difficult to minimize adverse environmental impacts when 75,000 tons of spent shale per day must be disposed of. For spent shales that are not returned to the mines, the statement indicates that off-site disposal locations will be made available on Bureau of Land Management lands, with special land-use permits. Concerning

the issuance of these permits, BLM regulations state:

stipulations as the authorized officer considers necessary to protect the lands and resources involved and the public interest in general. [43 CFR 2920.2(b)].

The stipulations must be sufficiently detailed to give proper notice to the operator as to what he can and cannot do with regard to the land involved in spent oil shale disposal. We do not feel that the provisions of 30 CFR 231 and 43 CFR 23 are adequate without such detailed stipulations. Without knowledge of the sites to be chosen for surface disposal of spent shale, it is impossible to analyze specific environmental impact. There are indications that several canyons may be filled with spent shale, potentially within the prime wintering grounds for the large deer herd in the area.

5. An evaluation of leachates from material containing nahcolite, dawsonite and halite that may be disseminated in the overburden material should be presented.

#### Effects on Ecological Systems

Although the draft statement describes in general terms the existing vegetational and wildlife resources of the oil shale development area, only a limited description of the ecological relationships of the area is provided. Although detailed environmental studies of the affected areas are not expected to be completed for several years, we feel that the final statement should discuss, at a minimum, the expected effects of oil shale development on the ecological systems of the area. For example, if it is determined that air pollution emissions from the retorting operations are

expected to adversely effect the vegetational resources of the area, this could in turn limit the amount of available browse vegetation for wildlife. Additionally, damage to vegetation may alter the erosional or hydrologic regimes of the area, resulting in serious losses of forage and habitat for wildlife. Such ecological relationships must be considered in a statement of environmental impact.

In the case of disturbances of large land areas of wildlife habitats such as may be the case at site C-a (p. IV-36, Volume III), we feel that a clear mandate should be given to operators, that, under such circumstances, they may have to provide alternate browse areas for fragile wildlife species such as mule deer. This provision could include the artificial stimulation of browse growth in areas currently possessing little browse.

#### Off-Site Impacts

As the draft statement indicates, the development of even a prototype oil shale industry in the presently sparsely populated regions of Colorado, Wyoming and Utah may result in extensive social and economic environmental impacts. Details should be provided in the final statement concerning the existence of adequate regional land-use plans and controls designed to cope with these impacts.

Further discussion of off-site impacts should consider such items as: industrial developments, including refining operations,

power generation, or petrochemical industries, that are related to shale oil availability; transportation systems; adverse effects on recreational and aesthetic values resulting from increased populations; plans for water supply and sewage disposal systems; and potential methods of solid waste disposal.

### Comments on the Proposed Oil Shale Lease

#### I. General Comments

In our view, the proposed Lease does not adequately address the long-term, and perhaps post-operational, maintenance that appears necessary to insure revegetation, that diversion ditches and dams continue to divert, and that subsidence will remain controlled.

The statement has not adequately provided for input to the Prototype Program from the ongoing efforts of the four-part Colorado Committee on environmental problems of oil shale (p. I-75, Volume I). It is recommended that the lessees be encouraged to cooperate with and utilize the data generated by the Colorado Committee.

On pages V-12 and V-13 of Volume III, lease terms 2(d)(3) and 2(d)(4) appear to be assuring the operators of continued operations past the point in time where it may be appropriate to cease operations because of "insurmountable environmental hazards". We suggest that the lease be reworded to clearly show that operations can be suspended at any time upon the determination that further development would be environmentally unacceptable.

Lease provision 2(c)(4)(iv) (page V-10 of Volume III) specifies that extraordinary costs may be credited against royalties (see also page I-12, Volume III). The final statement should define the term "extraordinary costs" and provide examples of the types of environmental costs that would qualify for this credit against royalties.

Lease provision 2(r)(2)(i) (page V-21 of Volume III), requires the submission of "a detailed development program" which we presume follows 43 CFR 23.8, prior to the third anniversary of the lease, but the reviewer of this plan for development is specified only as the "mining supervisor." We strongly recommend that EPA and other representative groups, perhaps including those currently members of the Field Oil Shale Task Force, be written into the review of this mining plan. We recognize the plan to keep the Field Task Force operative to review the mining plan, and the final statement should recognize this. These plans are critical to the success of the Prototype Program inasmuch as they will be the first commitment of each lease site to a specific type of mining and a specific type of restoration. Inadequate review at this point, compounded by a lack of public hearings, can result in a failure of the Prototype Program. The statement should insure that on-site retorting, upgrading, and refining processes are covered in the detailed mining plan [see also lease stipulation 11(B) (p. V-67, Volume III)].

Vol. III, pg. V-15, sec 2(h) Inspection and investigation:

The language of this lease term seems to limit inspection and investigation to "...any duly authorized officer of the Department."

This can be interpreted to mean that no person other than duly authorized employees of the Department of Interior can make inspections and investigations. There may be occasions when the mining supervisor would want an employee of another Federal or State agency (e.g. EPA, Colorado Department of Health, etc.) to conduct an inspection and there might be some question as to the legal propriety of such an action as this lease term is presently worded. Section 231.70 of 30 CFR Part 23.1 provides for inspections by the mining supervisor or his representative. It is suggested that this lease term be revised as follows:

To permit at all reasonable times by any duly authorized officer or representative of the Department:....

## II. Specific Comments on Lease Stipulations

### 1. Section 1, part (B), page V-45: Changes in Conditions

This section states that "mutual consent of the Mining Supervisor and the Lessee" is necessary to revise or amend the Stipulations. This stipulation should be amended to provide that if the Lessee does not consent to revisions or amendments considered valid by the Mining Supervisor, the amendment or revision will become effective in a period of 6 to 18 months, depending upon the significance of the change and the degree of effort required of the Lessee as determined by the Mining Supervisor.

### 2. Section 1, part (C), page V-46: Monitoring Program

This lease term as worded does not give the lessee any guidance as to what information should be included in the monitoring

program. It is suggested that the following sentence be added to this lease term:

This program shall include a description of the environmental parameters to be sampled, sampling frequency, the location and types of sampling equipment and techniques, and the analytical methods to be used.

3. Section 1 part (F), page V-47: Environmental Briefing

EPA should be included, by name, in sentence two, along with reference to the Mining Supervisor such that it has reasonable access to "Environmental Briefings."

4. Section 2, part (N), page V-54: Off-Road Vehicles

This part requires that off-road vehicles shall be used in a manner consistent with applicable regulations. The following phrase should be added to the end of this stipulation: "...issued in accordance with Executive Order 11644."

5. Section 7, part (A), page V-59: Spill and Contingency Plans

This lease term requires the lessee to detail in an oil spill contingency plan the measures to be used in controlling and abating oil spills once they have occurred. The lease term should be expanded to require contingency plans for both oil and hazardous substance spills as defined in section 311 of the Federal Water Pollution Control Act Amendments of 1972. Equally important as spill contingency plans are the actions planned by the lessee to prevent spills from happening in the first place. It is suggested that in addition to a



spill contingency plan, the lessee also be required to submit an oil and hazardous substances spill prevention plan. This spill prevention plan would include a discussion of the lease terms in section 2(E), (F), (G), and (H) dealing with pipelines; section 7(C) dealing with storage and handling; plant drainage; pump and in-plant process and transfer pipelines; and personnel training to minimize human error. The spill prevention plan should specify the actions proposed to prevent spills as a result of human error and transporting, storing, using and handling of oil and hazardous substances.

6. Section 8, parts (A), (B), (C), pages V-62, V-63:  
Pollution - Air

Provisions should be made in this section for ambient air surveillance systems that will provide data to monitor air quality at each development site in the area. Additional gaseous pollutants are not specified and other air pollutants are mentioned in general terms. Applicable air quality standards and other legal requirements should be cited here instead of referring to conducting processing operations so as not to create environmental or health problems associated with dust (V-62).

A quantitative treatment should be made for all sources of air pollutants and their control measures in this section.

Fugitive dust can be controlled by water spraying and watering down methods. A provision should be included in the lease stipulations that requires the owners or operators of construction equipment to employ water spraying and watering down methods (or other equivalent methods) to limit fugitive dust emissions.

7. Section 7, part (B), page V-61: Reporting of Oil Discharges

This lease term should be expanded to also require the reporting of hazardous substance spills.

8. Section 9, part (A), page V-63: Water Quality

The following phrase should be added to the end of the lease term after the word implementation: "...as adopted pursuant to the Federal Water Pollution Control Act, as amended 33 U.S.C. 1151 et seq.

9. Section 9, part (C)(7), page V-64: Control of Waste Waters

This stipulation indicates that reinjection of water is not to be accomplished without the Mining Supervisor's authorization. We suggest that at least in the State of Colorado such injection should be coordinated with the State.

10. Section 11, part (C), page V-67: Stabilization of Disturbed Areas

This part provides for repeated seeding and planting if prior attempts to revegetate are unsuccessful. Will there be a limit on the number of attempts to revegetate and reseed? Who will determine whether or not a seeding and planting attempt has been successful and what criteria will be used to determine success or failure?

11. Section 11, part (L), (2), page V-70: Revegetation

This part provides for revegetation. One aspect of this stipulation which is unclear is who will determine what the land will be used for after revegetation.

12. Section 14, part (A), page V-73: Mine Waste

This part provides for backfilling or reclaiming excavated material and spent shale. Backfilling of spent shale should always be required where technically feasible.

Alternatives to the Proposed Action

1. Volume II of the draft statement presents a very complete analysis of the energy production alternatives available at the present time. The conclusion reached on page 202 is that at least five alternatives appear to be potentially feasible for equalling this energy supply from oil shale for the 1985 time frame, namely: (1) reduced energy demand; (2) increased foreign imports; (3) increased domestic oil and gas production; (4) coal gasification, and (5) replacement of liquid fuels with equivalent quantities of electricity generated by coal and/or nuclear power. Assuming that the disadvantages of oil importation as an alternative outweigh the advantages, it is not clear from the statement why oil shale development is preferable to the other four alternatives. The advantages and disadvantages of shale oil development and the other alternatives are discussed in the statement. They all involve varying degrees of technological, environmental, social, economic and political problems. Substitutability is also a problem.

We feel that a more complete evaluation of the comparative impacts associated with each alternative should be presented in the final statement. For example, why is an oil shale prototype program preferable to a coal gasification/liquification prototype leasing program in the Federal coal fields of Wyoming and Montana? Why is oil shale development preferable to expanded production of oil from conventional sources and the development of new recovery technology?

Such a comparative analysis is necessary to logically develop the arguments supporting the final conclusion. Otherwise the reviewer is left up in the air.

In summary, if other sources of energy are available for development or expanded production within the same time frame which would supply equivalent amounts of energy as oil shale, it is imperative that these alternatives be examined and compared with the oil shale program in the final statement to determine which source (action) or combination of sources (actions) should ultimately be developed, even at the prototype level, to meet National energy needs at the lowest possible cost to our existing environmental and social systems.

2. Development of the oil shale resources on private lands now held by several oil companies is dismissed in the draft statement because only development on public lands in concert with development on private lands could make oil shale development economical and because more comprehensive environmental controls could be applied through the Federal leasing mechanism. Justification for this reasoning is needed in the final statement. The final statement should include a comparative economic analysis of oil shale development on private lands versus oil shale development on private and public lands. An analysis should also be presented comparing the environmental controls applicable to private lands versus the controls applicable to public lands under a leasing program. Similarly, data should be provided to support the contention that delay of the prototype leasing program would result in a "crash program" of development,

with little regard for environmental controls. In view of recent environmental legislation, the possible development of some of the energy alternatives mentioned in Volume II, and the probability that a National Energy Policy will be developed in the near future, a "crash program" to stimulate development of an oil shale resource seems unlikely.

3. Considerations should be given to the alternative of placing a retort in an underground mine.

4. In Volume II, Section V(A) Alternative Oil Shale Policies, consideration should be given to the formation of a Federal-State compact between Utah, Wyoming, Colorado, and the Federal Government, patterned after the Delaware River Basin compact. The administrative body of such a compact should have planning, construction, operative, and enforcement authority.

5. The alternative of reuse and re-refining of the many oils presently "dumped" is not presented. The "reuse" oil industry has been declining because of economic penalties, when, in fact, it may be a viable alternative.

#### Recommendations for Further Study

We recognize that the Department of the Interior and EPA have already sponsored some research concerning the environmental problems of oil shale development. While one purpose of the prototype program is to find answers to many of the environmental "unknowns" of oil shale, we feel that the final statement should more clearly indicate that if the prototype program fails to satisfy the more important

environmental research needs of a large-scale oil shale industry, provision will be made for continuing research before development proceeds beyond the prototype level. If the prototype program fails to supply answers to the more important environmental questions within two years, separate research programs should be established. At a minimum, the following areas of research should be considered:

1. Use of Saline Water for Wetting Spent Shale

The cementation process resulting from wetting spent oil shales has been studied and is well documented in the environmental impact statement. However, the aquifer in the C-a proposed lease near Piceance Creek may be highly saline. Since this water is proposed for wetting spent shale, the wetting process should be studied during the prototype program to determine if the high concentrations of salt inhibit cementation and increase leachability. Assuming the water is highly saline, its use must be controlled carefully to avoid excessive amounts which could run off into streams. Desalination may be required.

2. Differential Thermal Absorption of Carbonaceous Spent Shale

Differential thermal absorption of carbonaceous spent shale dumps could generate large areas of land with higher thermal content than the environment, thus affecting the microclimate and possible thermal convection over larger areas. The winter habitat of wildlife may also be affected.

### 3. Beneficial Uses of Spent Oil Shale

Completely burned spent oil shale has potential as a cement and lightweight aggregate. Carbonaceous spent oil shale has potential as a soil cover to store heat to lengthen growing seasons and protect against frost. These potential uses should be investigated during the prototype program as alternate methods of solid waste disposal.

### 4. Electrostatic Precipitators for Spent Shale Ash Removal

In order to minimize air pollution from the burning of carbonaceous spent shale, electrostatic precipitators can be employed for particulate removal from stack gases. However, since the stack gases are expected to contain little sulfur, the resistivity of the gas is higher and the efficiency of electrostatic precipitation is reduced. Experience is being gained in handling stack gases from power plants burning low sulfur containing coal. The prototype program should provide for further investigations in this field.

### 5. Health Effects of Carbonaceous Spent Oil Shale

Carbonaceous spent oil shale is susceptible to potential autooxidation which increases the temperature of the shale. Such autooxidation may be likely as hot spent shale is discharged from the retort. This temperature increase may produce gases and vapors from the carbonaceous layer which covers the spent shale (approximately 4% by weight). In order to prevent autooxidation, it may be necessary to quench the shale with water. Such quenching could result in the release of harmful gases or particulates. In some cases, the autooxidation leads to spontaneous combustion with the undesirable effect

of burning shale in the open atmosphere; if combustion does not occur, gases and particulates may be released which could have detrimental environmental effects. A study is needed to determine possible adverse health effects and practical methods for controlling autooxidation.

## 6. General

Additional needs for further study have been outlined elsewhere in our comments, and the above discussion is not meant to be exclusive. For example, we have cited the need for study and documentation of practically all environmental factors, such as water supply and quality, surface subsidence, ecological effects, and air quality. Secondary effects, such as increased water resource project activity resulting from Bureau of Reclamation funding from royalty payments, should also be considered. It is our hope that the Department of the Interior will consider the recommendations of the approved two year Colorado study of the environmental impacts of oil shale development in the issuance of development permits for the prototype program.

## Conclusions

We feel the draft statement represents a sincere effort on the part of the Department of the Interior at an objective analysis of environmental impacts. Our comments on the draft statement are intended only to raise questions that, when answered, may improve the presentation of environmental impacts in the final statement. Our comments do not imply a "position" on the basic question of development or non-development of the oil shale resource, and we feel that a continued, careful analysis of the environmental effects



of the oil shale leasing program should enable the Department of the Interior to make the ultimate decision concerning the issuance of leases for development. We hope that our comments will aid the Department in making that decision.

The draft statement acknowledges that the prototype program involves many economic, environmental, technological and social unknowns. Because of these unknowns, the discussion in the statement is based largely on informed assumptions. We are concerned that the final statement may not provide a substantive basis for evaluating the environmental impact of the actual operations on and off the lease tracts.

We note that under the lease provisions [sec. 2(r)] that the lessee must file a detailed development program for the approval of the mining supervisor within three years after the lease date. This development program will include a schedule of planning, exploratory development and production operations as well as the following plans:

1. monitoring plan,
2. fish and wildlife management plan,
3. oil spill contingency plan, and
4. erosion control and surface rehabilitation plan.

These development programs will contain specific operational information which can provide a substantive basis for evaluating environmental impacts. It is also possible that coincidentally with the filing of a development program that the lessee will apply for special land-use permits for off-site disposal of spent shale and liquid wastes.

Because of the major potential environmental impact of this program, it is our opinion that further environmental analyses should be prepared prior to the approval of development programs or special land use permits. These environmental analyses should be available to the developers to assist in the preparation of a development plan that will insure maximum environmental protection during actual operations. In addition, the lessee should be required to submit a detailed environmental analysis report as part of the mining and development plan. Should the findings of further environmental analyses or the promulgation of further environmental regulations surface considerations that may require a change in the overall concept of the prototype program, these considerations should be immediately brought to the attention of the Field Oil Shale Task Force in order to permit resolutions that would protect the interest of the lessee while at the same time insuring the protection of the environment. We suggest that the Department of the Interior recognize that the magnitude of these considerations may necessitate the preparation of supplementary environmental assessments and other environmental safeguards as the program develops.

Our Agency is prepared to assist, to the extent our resources permit, in the development and review of the mining development programs and special land use permits. We request that the Regional Conservation Division Manager of the U.S. Geological Survey confer with the Regional Administrator of EPA before the Department of the Interior approves these mining plans and land use permits. We look forward to actively participating in the Field Oil Shale Task Force and to assisting the Department of the Interior in its efforts toward carrying out this program with maximum protection for environmental factors.

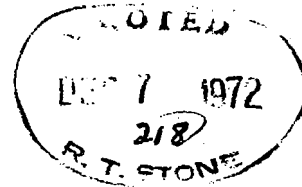
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FEDERAL POWER COMMISSION  
WASHINGTON, D.C. 20426

IN REPLY REFER TO:

DEC 6 1972

Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240



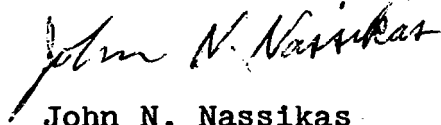
Attention: Mr. Reid Stone

Dear Mr. Stone:

We are pleased to have an opportunity to comment on your draft environmental statement, dated September 1972, covering a proposed Prototype Oil Shale Leasing Program. The Commission is vitally concerned with any action either by government or industry which will increase available energy supplies to the consuming public and has for some time been actively directing its attention and efforts toward those regulatory actions within the scope of its authority which will improve the current imbalance between natural gas supply and demand. The Commission in addition to having taken numerous steps to stimulate exploration and development has taken other actions designed to bring available supplies and market demands more closely into balance. We view the proposed prototype oil shale leasing program as having the potential for improving the supply situation for both oil and natural gas. At the same time we would observe that any program for oil shale development be undertaken in a manner which will minimize, or eliminate the potential for interference with the development of any oil or gas resources which might underlie the oil shale deposits. We of course recognize that there may be potential detrimental environmental effects to be considered and evaluated. It is important that a balanced approach be followed which will achieve needed resource development and the raw energy supplies to meet our social and economic objectives, at the same time giving full consideration to environmental concerns.

The Commission staff has reviewed the draft environmental statement and their comments are attached for your consideration. Based upon an evaluation of these comments, we concur with the conclusion that a balancing of the national interests appears to support proceedings with the proposed prototype oil shale leasing program.

Sincerely,

A handwritten signature in dark ink, appearing to read "John N. Nassikas", is written over a horizontal line.

John N. Nassikas  
Chairman

Enclosure

Staff comments on draft environmental statement  
dated November, 1972.

**FEDERAL POWER COMMISSION**

**STAFF COMMENTS**

**ON**

**DRAFT ENVIRONMENTAL STATEMENT  
PREPARED BY DEPARTMENT OF INTERIOR  
REGARDING PROPOSED PROTOTYPE  
OIL SHALE LEASING PROGRAM**

**DRAFT STATEMENT CIRCULATED PURSUANT  
TO SECTION 102(C) OF NATIONAL  
ENVIRONMENTAL POLICY ACT OF 1969**

**Washington, D. C.**

**November 1972**

## Comments on Draft Environmental Statement

The U. S. Department of the Interior circulated for comments a Draft Environmental Statement (DES) dated September 1972 covering a proposed prototype oil shale leasing program of up to six leases of not more than 5,120 acres each, located in the general area of the Colorado-Utah-Wyoming boundaries. Two tracts each are to be developed in the Piceance Creek Basin (Colorado), the Uinta Basin (Utah), and the Washakie Basin (Wyoming).

Oil shale holds the potential for greatly expanding the nation's domestic supply of proved oil reserves at a time when the availability of both oil and natural gas, which furnish about 75% of the nation's total energy needs, is becoming increasingly dependent on foreign sources. The international ramifications of such dependence presents a strong case for the development of oil shale resources.

Because of different physical-chemical properties, oil and natural gas are not directly substitutable as energy sources. For example, about 95% of the energy consumed in the transportation sector in 1971 came from petroleum sources. On the other hand, natural gas furnished 52% of the energy consumed in the industrial sector and 24% of the energy used for electric power generation, as compared to only 25% and 14%, respectively, by liquid products. 1/

These two sectors where natural gas is consumed in significantly greater quantities than oil both use boiler equipment which can often use alternate fuels. For this reason, any increase in oil supplies could decrease the consumption of natural gas through the substitution of oil for gas in these boiler facilities. Oil shale development could therefore affect natural gas consumptive patterns by supplanting some uses of gas with oil. Additionally, technology may someday provide the means of converting oil shale directly to gas, thereby affecting these consumptive patterns in an additional way.

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1/ Department of the Interior, U.S. Bureau of Mines news release, March 31, 1972, "U.S. Energy Use at New High in 1971."

As part of its function, the Federal Power Commission regulates the interstate aspects of the natural gas industry. In this conjunction the Commission is concerned with the deteriorating gas supply-demand situation and the potential for improving the situation through the development of oil shale resources.

Although the planning and policy decisions leading to the current national shortage of natural gas were in the embryonic stages in the early 1960's, the actual effects of these policies did not become apparent until 1968. Prior to that year for as long as natural gas statistics have been compiled, reserve additions exceeded production. However, in 1968, 1969, and 1971, production surpassed new reserves added by 5.7, 12.3, and 12.3 trillion cubic feet, respectively, including Alaska. <sup>2/</sup> In 1970 this recent trend was temporarily reversed, but only because of the one-time statistical event resulting from the inclusion in the reserve inventory of the vast but remote and presently inaccessible North Slope Alaskan reserves. As a consequence, year-end reserves for the conterminous United States began to decline in 1968 for the first time on record from the all-time high of 289.3 trillion cubic feet in 1967 to 247.4 trillion cubic feet in 1971.

The trends exhibited by the natural gas supplies of interstate pipeline companies, as reported in the FPC Form 15, closely parallel the trends of the nation's total gas supply. While the level of reserve additions fell, production reached record levels of about 14.0 trillion cubic feet in 1970 and 1971. Year end reserves began to decline in 1968 and have decreased 36.8 trillion cubic feet to the 1971 level of 161.3 trillion cubic feet. As a consequence, the reserve to production (R/P) ratio has decreased from 20.2 in 1963, when such data was first compiled, to 11.5 in 1971. The R/P ratio is often erroneously thought of as being years of remaining proven supply. However, the ratio does not completely describe all of the physical limitations which govern the rate of gas withdrawal or the exponential nature of the growth and decline of resource discovery and production. Nevertheless, the steady

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<sup>2/</sup> American Gas Association annual publication, Natural Gas Reserves in the United States and Canada. Data for 1971 from American Gas Association press release, AGANEWS, March 29, 1972, "Natural Gas Proved Reserves Fell Again in 1971; Production Increased Slightly to Record Level."



decline of the R/P ratio, which is a commonly used indicator of the gas industry's working inventory, may be one form of exhortation of impending deliverability problems if the ratio does not begin to level off at some optimum value.

All evidence leads to the conclusion that the supply shortage is worsening. Fifteen pipeline companies have projected firm requirement deficiencies for the 1972-73 heating season, and the volume of gas available for interruptible sales have been decreasing sharply. As of November 1, 1972, twenty-two applications for authorization to import liquefied natural gas (LNG) from North Africa or Canada have been filed with the Commission, and three of these are for base load imports. In addition, five applications have been filed concerning the conversion of foreign liquid hydrocarbons to substitute natural gas (SNG). An application has recently been filed with the Commission for authorization to transport gas derived from coal in interstate commerce, and another company has advised that a second application involving a coal gasification project will be submitted in the very near future for Commission approval. The conversion of methanol to SNG is receiving increased attention as a means of supplementing domestic gas production. However, the cost of gas made available through these supplemental sources will entail substantial increases in prices.

A survey of the fifty states and four territorial regulatory agencies conducted in 1971 by a subcommittee on gas for the National Association of Regulatory Utility Commissioners revealed that the heavily industrialized eastern and mid-western states have had to develop major programs to counter the current gas shortage. New customer attachments have been restricted in several areas, and additional supplies to some present customers have been denied. Curtailment plans have had to be developed to determine customer priority in times of shortage.

The Commission has taken several approaches to elicit increased supplies of natural gas. In March 1971, it adopted a blanket certificate procedure for small producers by which they can make gas sales at prices above area rate ceilings and with less burden of regulation, with the concomitant

effect of easing market entry. In the past three years, the Commission has established area rates in all areas of the nation (with the exception of new gas for the Rocky Mountain area), and it expanded and modified the area rate concept to recognize the realities of risk, the market place, and other economic considerations, including cost and other relevant factors. As of October 1, 1972, approximately \$1.25 billion in advanced payments had been committed by interstate pipelines to suppliers for gas to be delivered at a future date. Although prepayments for exploration and lease acquisition were originally excluded from rate base treatment, the Commission is re-evaluating that policy. In August 1972 the Commission adopted as a statement of policy a proposed optional certification procedure that is available to all natural gas producers and for contracts covering the sale of gas in interstate commerce produced from wells drilled after April 6, 1972, or for gas not previously sold in interstate commerce. The Commission has also ordered that temporary emergency sales and deliveries of natural gas for resale in interstate commerce be permitted for up to 60 days without prior Commission authorization and without affecting the seller's jurisdictional status. In addition the Commission has ordered the institution of a National Gas Survey, the first comprehensive gas resource study undertaken by any agency of the Federal government, to provide a more definitive basis for the establishment of long-range government resource and regulatory policy.

The supply short-fall has been accompanied (and perhaps in part directly precipitated) by unprecedented demands for natural gas. If the gas industry could continue to capture large shares of the energy market as it has in the past when supply was not a major constraint on growth, demand could reach almost 50 trillion cubic feet per year by 1990. For comparison, demand in 1971 was on the order of 22 trillion cubic feet. It is apparent that this level of demand cannot be fulfilled via conventional domestic productive capacity and that supplemental sources of gas must be developed to mitigate projected deficits between demand and supply.

One of the stated purposes of NEPA is to encourage productive and enjoyable harmony between man and his environment. Natural gas is the cleanest burning fossil fuel, its combustion products being essentially carbon dioxide and water. In our struggle to improve the quality of life of the urban dweller, it is essential to assure an adequate supply of natural gas to improve air quality. To this end the Commission believes it is in the public interest to give strong consideration to any potential energy supply that can ameliorate the gas supply-demand imbalance; oil shale development holds great potential for such improvements.

The oil shale development project proposed by the Department of Interior could affect this supply-demand imbalance in three primary ways, all of which need to be more adequately considered in light of the current gas shortage, the potential for oil shale development to improve the gas shortage, and the Commission's responsibility to assure an adequate supply of natural gas while using its regulatory powers to conserve natural resources and improve environmental quality.

The first point which needs to be elucidated is the availability of alternatives to the oil shale leasing program. There is an inherent tendency in Volume II of the DEIS to infer that the numerous alternatives which are discussed would only need to be developed if the leasing of public lands for oil shale resource development is abrogated. For instance, on pages 130-131 of Volume II it is stated that at least six LNG plants of the general magnitude of the Columbia LNG, et. al., facilities at Cove Point and Savannah would be required as an alternative to the oil shale project. However, because of growing population, increasing per capita gas consumption, and long lead times and other factors, similar types of LNG projects can probably be expected to proceed concurrently with an oil shale project. Development of one will not preclude the other.

As a consequence, a discussion of alternatives to the prototype oil shale leasing program should be in the context of a national energy policy rather than in terms of discrete, individual projects. Coal resources for electric power generator and for coal gasification, conventional oil and gas resources, and gas derived from nuclear stimulation of low permeability reservoirs are all potential sources of energy that could be tapped in the three-basin area being considered for oil shale development. The compatibility of developing these technologies needs to be comprehensively analyzed. While a national energy policy is still in the formative stage, an adequate discussion of the relationship between these various energy sources will illustrate the urgent need for such a policy. The Bureau of Mines has estimated that as much as 317 trillion cubic feet of natural gas might be recovered from the same general region as where the oil shale strata occur. It is imperative to determine whether and to what extent the development of one energy resource will affect the development (and timing) of another.

The second point of major concern to the jurisdictional responsibilities of the Federal Power Commission is also related to the question of a national energy policy. Some gas production does occur in the Piceance Creek, Uinta, and Washakie Basins. On pages II-59 of Volume III of the DEIS, gas production from the Southman Canyon field is noted from one of the tracts in Utah. While gas production thus far has been relatively small, the potential gas resources for the general region as noted in the DEIS on page II-13 of Volume I may be about 85 trillion cubic feet. To assure a multiple use approach to resource development, an oil shale project should have as little impact as possible on existing and future drilling and pipeline facilities, and the need for a multiple use approach should be reviewed in the final DEIS.

Finally, to the extent that oil becomes available from oil shale and can be substituted for gas (in boilers, for example), less gas may be consumed for inferior uses. Some gas may be consumed for various processes associated with oil shale development, as indicated on page I-65 of Volume I, but it is

axiomatic that this small amount of gas should be more than offset by the potential for increased gas supplies for more desirable uses which would be made possible by the increased supplies of oil for industrial fuel and electric power generation.

Oil shale development holds the promise of increasing gas supplies in yet another fashion if the proper technology and economic climate should prevail at some future time through the conversion of oil shale directly to gas rather than to oil. While the economic viability of the conversion technology is yet to be established, greater research and development could increase the attractiveness of this possibility which would have the benefit of an extensive existing pipeline network.

While the major points which directly concern the Federal Power Commission and which should be incorporated in the final DEIS and into the decision-making process involving the proposed prototype oil shale leasing program have been enumerated above, some minor comments are also offered to clarify specific statements which appear in Volume II. On page 121, reference is made to three proposals to transport North Slope and Arctic gas reserves to lower 48 markets. Two of the consortia have now merged. On page 129, the DEIS shows a projected schedule of LNG imports through 1985 (based on the Federal Power Commission Staff Report No. 2, National Gas Supply and Demand, 1971-1990) and states that pending applications could bring about these import levels. The use of the term "pending" could be misconstrued to mean presently pending before the Federal Power Commission, and this would be incorrect. Only three long term projects involving a total of about 645 billion cubic feet annually have been filed with the FPC thus far.

## Conclusions

The proposed prototype oil shale leasing program should be conducted at the earliest possible date after due consideration has been given to the social, economic, technologic, environmental, and attendant problems of the project. This

program is in accord with the President's energy message of June 4, 1971, in which he requested that the Secretary of the Interior initiate "a leasing program to develop our vast oil shale resources, provided that environmental questions can be resolved." As stated by the President, "A sufficient supply of clean energy is essential if we are to sustain healthy economic growth and improve the quality of our national life." The U. S. is the single largest energy-consuming nation in the world, accounting for one-third of the world's total consumption; and the growth of our national economy supporting our technologically advanced civilization is in part dependent on the proper management of our resource base to serve the priority requirements of our economically productive society.

In light of the current gas shortage, our increasing dependence on foreign oil supplies, and the delays in constructing nuclear plants, leasing offshore lands, and obtaining North Slope and Arctic gas and oil supplies, this oil shale leasing program needs to be conducted; it is a prototype -a model - to attest to the economic and ecologic viability of oil shale development upon which appropriate policy decisions can be made at a later time. Any future oil shale development will require separate environmental impact statements, and judgments of future leasing will benefit from and can only be made on the basis of the prototype. If the prototype is a failure on either economic or environmental grounds, the program can be curtailed. For example, serious attention must be directed to both the direct and indirect effects of strip mining and the ability to reclaim such land, but without the prototype, any long range policy decisions will have to be made without a complete repertory of facts. The prototype development program will not only provide data for energy planners, but it will be of invaluable use for land management planning in determining the best multiple uses of this relatively pristine area, including its resource potential for wilderness and recreational use.

While the affects of any single project may not be serious, the aggregate consequences may be synergistic, the total effect being greater than the sum of the individual

effects. Only with the implementation of farsighted national energy and land management policies encompassing the interaction of population, economic growth, resource depletion, and environmental protection, can the complex problems facing decision-makers be satisfactorily resolved. The proposed prototype oil shale leasing program should be an impetus in our endeavors to demonstrate that we can develop a vast energy source while assuring sound principles of land management and environmental protection.



# United States Department of the Interior

GEOLOGICAL SURVEY  
WASHINGTON, D.C. 20242

OFFICE OF THE DIRECTOR

November 7, 1972

## Memorandum

To: Oil Shale Coordinator  
Through: Assistant Secretary--Mineral Resources *noted: Wils*

From: Director, Geological Survey

Subject: Review comments on Draft Environmental Statement,  
Proposed Prototype Oil Shale Leasing Program

Several people from the Geological Survey participated in drafting the subject environmental statement; however, on re-reading the draft as it was issued, we have several comments and suggestions for change:

### Volume I

#### Description of Regions and Potential Environmental Impacts

Page I - 41. - The last paragraph on this page refers to dams and conduits which might be used to control flash flooding. However, the stipulations in Volume III do not mention such dams and conduits. Statements of assurances which mitigate environmental impact should be carefully reviewed for follow-up performance in the stipulations.

Page I - 42, 43. - The summary of the Colorado State University's experiments outlined here does not adequately describe the results of the experiment. It fails to mention, for example, the extremely high concentration of dissolved materials that were found in the first small volumes of water that passed through the spent oil shale. The environmental impact statement, in order to report the CSU's work accurately, should include all the data from Table 8 of Reference 13.

Page I - 44. - The stipulations make no requirements for follow-up on the vegetation, although the explanation in Part I clearly states that irrigation, and probably continual fertilizing, is necessary in order for vegetation to grow and keep its start.

Page I - 63. - The first paragraph makes no mention of the potential problem of spilled oil soaking into the ground. The problem of spilled oil contamination of ground water seems to be ignored throughout Volumes I and III of the environmental statement.





Page I - 64. - It is not clear whether irrigation will be required on revegetation accompanying road construction. From the statement, the reader would assume that irrigation would be necessary in order to establish revegetation. Without irrigation, the environmental effects would seem to be maximum. The footnote on page 64 is misleading; rather than giving a percentage, it should state that 390,000 barrels of oil were spilled.

Page I - 65. - The first few lines on this page are deceptive in stating an average amount of oil spill. Obviously a spill may range from a few drops to thousands of barrels.

Page I - 73. - The report does not say how many monitoring stations are needed. We once estimated that one would be needed on each stream flowing into and out of each of the study sites. Although this section of the environmental statement says that the stations are needed, nothing is stated in the stipulations or anywhere in the plans to provide for financing the stations or operating them.

Page III - 43. - A statement should be inserted here to say that studies are now underway that will give additional data, and that such studies are expected to be completed in 1974.

Page III - 44. - The problem of ground water contamination from spilled oil is ignored. This possibility should be mentioned and discussed in this section.

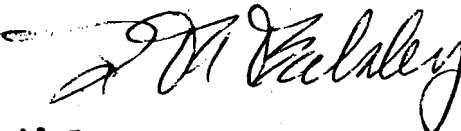
### Volume III

#### Description of Selected Tracts and Potential Environmental Impacts

Page II - 29. - The paragraph beginning on line 5 states that transmissivity of the leach zone seems to vary from several hundred to more than 10,000 gallons per day per foot. The same can be said for the zone about the B groove, based on testing done by our Water Resources Division's Colorado District in the summer of 1972.

Page V - 44. - We feel that the present stipulations do not adequately state that the lessee is responsible for providing his own water supply and for complying with the rather strict Colorado regulations on appropriation, transportation, and storage of water. These regulations apply to both surface water and ground water.

Page VII - 5. - The last sentence should be revised to read "Dewatering the Green River Formation" instead of "Dewatering the leached area."



Acting Director

LETTER NO. 9



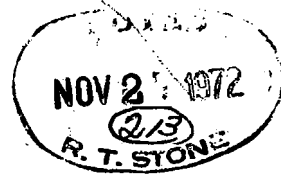
United States Department of the Interior

NATIONAL PARK SERVICE  
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

L7427-OCC

NOV 24 1972



Memorandum

To: Oil Shale Coordinator  
Through: Assistant Secretary for Fish and Wildlife and Parks

From: Assistant Director, Cooperative Activities

Subject: Draft Environmental Statement - Oil Shale

The National Park Service has reviewed the subject statement transmitted with your memorandum of September 7 and offers the following comments.

Although we feel the immediate changes in land use as a result of this proposal would not be of considerable significance, subsequent and cumulative land changes which will result if this initial effort is found to be a feasible procedure are viewed with considerable concern by the Service. As the expected industrialization of the oil shale areas proceeds, significant changes may occur in both the quality and quantity of the water resources in the Colorado River basin. Will the pristine character of Dinosaur National Monument, of Canyonlands National Park, and of the parks along the lower Colorado gradually be lost as use of the river system accelerates? Even if human and industrial wastes are successfully kept from polluting the river systems, the face of the land will be permanently changed. We urge that, in the planning for land restoration, the concept of recreational reserves be evaluated as an important future use for reclaimed lands.

Although the proposed leases do not infringe on any existing or proposed units of the National Park System, nearby parks which might anticipate increased visitor use as a consequence of this program are Dinosaur National Monument, Colorado-Utah, Canyonlands National Park, Utah, and Colorado National Monument, Colorado.

As recognized in the statement, the proposed action will not adversely affect any sites that are eligible or recommended for registration as National Historic, Natural, or Environmental Education Landmarks. However, natural region studies of the Wyoming Basin and the Great Basin are now underway and studies of the Middle Rocky Mountain and Colorado Plateau



National Parks Centennial 1872-1972

natural regions are scheduled to begin within the next two years. These studies will contain inventories of potential natural landmarks of all types. The Piceance, Uinta, Green River and Washakie Basins all lie entirely within the scope of these studies.

We note in the document that only minimal attention has been given to the presence or absence of cultural resources (resources of archeological, historical or architectural significance) within the prototype lease areas. The statement is silent in respect to compliance with Executive Order 11593 (36 FR 8921) which requires a survey of cultural resources on Federal lands and nomination to the National Register of Historic Places of any sites that appear to qualify for listing. We strongly suggest that its procedures be scrupulously followed especially before any expanded commitments are made to allow the mining of Federal oil-shale lands. A mining program of the magnitude that might result in the future would be unavoidably destructive of all cultural resources in its path. Accordingly, a professional survey to locate and identify cultural resources is prerequisite to the preparation of any related draft environmental statement under the National Environmental Policy Act of 1969 (83 Stat. 852).

We wish to point out that the mining supervisor could not authorize the destruction of any antiquities without a designation of authority from the Secretary of the Interior under the Antiquities Act of 1906 (34 Stat. 225). In mitigation of the impacts of this and future proposals, we believe the statements should more clearly indicate what measures will be taken to recover data and materials from cultural resources that will be unavoidably lost or damaged by the project in compliance with Executive Order 11593. Should surveys discover cultural resources worthy of nomination to the National Register, the statement should indicate fully the steps taken to comply with Section 106 of the National Historic Preservation Act of 1966 (80 Stat. 915) and Section 2(c) of Executive Order 11593.

We appreciate the opportunity to offer our comments on this important program.

*Frederic R. Evers*



## United States Department of the Interior

OFFICE OF COAL RESEARCH  
WASHINGTON, D.C. 20240

Memorandum

OCT 16 1972

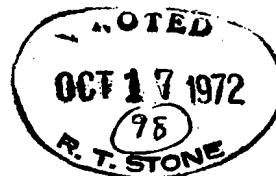
To: Oil Shale Coordinator, Mr. Reid Stone

From: ~~Acting~~ Director of Coal Research

Subject: Draft Environmental Statement - Oil Shale

The Office of Coal Research has been asked to comment on the above indicated environmental statement. We claim no expertise regarding oil shale technology or the impact such commercialization will have on the environment in the areas affected. We are impressed by the care and time spent in developing Volumes I and III - regional and tract impacts.

We find Volume II - Energy Alternatives generally acceptable, except for the limited treatment accorded coal gasification, coal liquefaction and the potential coal conversion processes. Since program statements covering coal conversion are being prepared in the Department of the Interior, it should be possible to provide additional material in the Final Environmental Statement.



EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF EMERGENCY PREPAREDNESS  
WASHINGTON, D.C. 20504

OFFICE OF THE DIRECTOR

OCT 17 1972



Mr. Reid Stone  
Oil Shale Coordinator  
Department of the Interior  
Room 7000  
Washington, D. C. 20240

Dear Mr. Stone:


My staff has reviewed the "Draft Environmental Impact Statement for the Proposed Oil Shale Leasing Program." Our overall impression of this document is favorable, and I hope that it will increase general acceptance of the vital need for initiating oil shale development in this country.

The volume on energy alternatives and your treatment of the section "Combinations of Alternatives" were well done. However, its concluding statement: "For some time to come the basic alternative to the production of 1 million BBLS/Day of shale oil will be a million BBLS/Day of imported Petroleum," caused me some concern. Surely, by 1985 we will have more options than simply more petroleum imports. The authors may have been too conservative in this case. It is likely, for instance, that coal liquefaction and other alternative processes will be further into the development stage than projected.

This section's treatment of the staggering balance of trade deficit suggested by our current and projected rate of increased oil imports could also be expanded. If a million barrel-per-day oil shale industry is in existence by that time it will cut our foreign oil bill by something approaching \$2 billion per year. A viable oil shale industry would also tend to set an upper limit on the price of crude oil that mid-eastern producers could expect the U. S. to pay.

I am certain that environmentally acceptable methods can be found to permit the orderly development of oil shale. You and your associates are to be congratulated on a job well done. I have requested my staff to continue their consultation with yours on the detailed editing suggestions that were provided.

Sincerely,



G. A. Lincoln  
Director

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

P. O. Box 17107, Denver, Colorado 80217

September 19, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Office of Asst. to Sec. for Mineral Resources  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

We have reviewed the Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program.

We have the following comments:

1. On August 11, we sent our comments to you after reviewing the preliminary draft of the statement. We indicated that the sections dealing with description of the natural vegetation were weak. We believe these sections in Volumes I and III of the draft environmental statement could have been improved. The broad vegetative types described do not adequately reflect the complexity of natural plant communities in the area. There are inconsistencies in the treatment of plant names. The listing of plants "in order of importance" is confusing and appears to describe vegetation only in relation to its value for livestock grazing. A more comprehensive ecological description of plant communities would be more appropriate.
2. In Volume I, VIII-9, USDA is not listed as a federal source from which comments are being solicited.

Except as noted above, we believe the statement is well prepared and meets the requirements of NEPA.

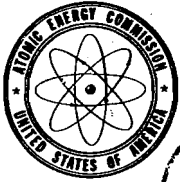
We appreciate the opportunity to comment.

Sincerely,



M. D. Burdick  
State Conservationist





UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545



NOV 10 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

Thank you for the opportunity to comment on the draft environmental statement for the proposed prototype oil shale leasing program which was issued in September 1972. We found the statement to be quite responsive to the National Environmental Policy Act and the recent court decisions which have offered interpretations of the Act. The alternatives section seems to cover the more probable alternative sources of energy which may be used if the oil shale program is not pursued actively.

We are offering some general observations and also enclosing staff comments which present more detail on specific parts of the report for your consideration in preparation of the final statement. The Increasing Nuclear Energy Development section seems to encompass most of the material developed with DOI staff for the OCS Leasing Statements; however several statements from the TAPS statement have been used and some revision is required to present an accurate evaluation. Specific suggestions are offered in the enclosed comments. Specific comments are also offered on the Nuclear Stimulation of Natural Gas Reservoirs section.

The Atomic Energy Commission supports all energy resource development programs that can be accomplished without undue harm or risk to the environment and without needlessly precluding the development of other natural resources. Therefore, we suggest that, in keeping with the expressed DOI program goal of stimulating the timely development of commercial oil shale technology with minimum possible impact on the present environment, a fuller discussion of less

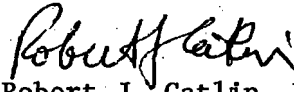


NOV 10 1972

environmentally severe technologies such as in-situ retorting be provided in the statement. Of particular concern is the commitment of land and water resources should mining and surface retorting technology be employed. Since the proposed bonus bid lease format based on mining would appear to discourage development of other low environment impact technologies, the relative environmental impact of this approach to stimulation of economic development should also be discussed.

We hope that these comments are helpful to you in the preparation of the final statement.

Sincerely,



Robert J. Catlin, Director  
Division of Environmental Affairs

Enclosure:  
Staff comments

STAFF COMMENTS  
DRAFT ENVIRONMENTAL STATEMENT  
PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM  
DEPARTMENT OF THE INTERIOR  
SEPTEMBER 1972

A. Specific Comments

Volume I

1. On page I-34, to be correct, the second sentence in the third paragraph should be revised to read, "A feasibility study for a proposed nuclear experiment known as Project Bronco was accomplished in 1967 and a project was proposed for the Piceance Creek Basin." For the same reason, the fifth sentence in the paragraph should read, "The lack of firm data from an experiment limits further analysis of this technique."
2. On page I-40, the explanation at the bottom of the page on how spent shale will be initially disposed of in box canyons needs more extensive exploration as to environmental impact. Otherwise, the following technical discussions would be lost to the average reader.

Volume II

3. Pages 124 and 125 have been inadvertently reversed. Also, in the penultimate paragraph, for the purpose of clarity, the last part of the paragraph should read, "To accomplish this level of production (i.e., stimulation of 50 wells per year), it would be necessary to explode a total of 4,000 nuclear devices of 100 kilotons each in 1,000 wells over a 20 year period. If the nation's need for gas demanded it, the development could proceed more rapidly."
4. On page 162, for correctness, the second sentence of the first paragraph should read, "Installed capacity in 1970 was 7000 MW and is currently over 13,000 MW." The last sentence in the paragraph should be omitted for the same reason, since variance in the estimates is due to a number of factors of which environmental concern is not major.
5. On page 163 the reference to Table III-4 should be III-6. Also there is confusion as to the source of the 37,000 to 50,000 MW of electrical generating capacity in both paragraphs on page 163. The 320,000 BPD of oil referenced will supply only about one third of that number of plants. This should be clarified.

6. On page 168 the paragraph dealing with the effects of transmission lines is not germane. Since the postulation is that nuclear power would replace oil for an equivalent number of fossil burning units it also replaces their existing transmission lines. Therefore, there is no increase in the number of lines - only a different location and hence no additional adverse environmental impact.
7. On page 169, the first sentence does not add anything to the discussion and therefore could be eliminated.
8. On page 171, the first paragraph "however, the..... of occurrence" has been eliminated from OCS Leasing Statement and should be deleted from this statement. It deals with a matter under current resolution and is not germane to plants built in the time frame discussed in this statement.
9. On page 177, the numbers 192 MW capacity and 508 million BTU appear incorrect; it is suggested they be checked against "Assessment of Geothermal Resources," dated September 25, 1972, by Dallas Peck, U. S. Geological Survey. Also the final statement in this section on page 178 does not appear consistent with the Peck assessment.

## B. General Comments

### 1. Construction Activities

The statement is specific with regard to the environmental consequences of much of the construction directly or indirectly connected with the proposed oil shale recovery program. However, although the need for additional water supplies is discussed frequently (I-I-64, I-II-72, I-III-36, I-V-3, III-II-30/48/62, III-VII-5), the presumably significant environmental effects of such required dam and reservoir construction has not been presented. In view of the extent of these requirements, such an omission appears to represent a deficiency in presenting the full environmental impact.

### 2. Effects of Mineral Recovery Operations

Although the potential of the recovery of nahcolite and dawsonite values with the oil shale is mentioned in the environmental statement (I-I-31), no evaluation of the environmental consequences of the mining of these resources is made in the reference document. This may possibly be due to a lack of information on the required technology (I-VI-2). However, if there is intent by the lessees of Federal lands to engage in mining of such minerals in conjunction with oil shale recovery, the consequences should be discussed in the statement, especially inasmuch as this point has been raised in conjunction with the previous environmental statement (I-VII-42).

### 3. Effects on Other Reserves

While it is acknowledged in the statement that other energy reserves exist in certain of the areas in which oil shale recovery is contemplated (I-IV-4), no discussion is given with regard to the possible effects of the oil shale industry on the recoverability of these other reserves, particularly those reserves that could be developed with less environmental impact. Thus, this potential "cost" of oil shale recovery has apparently not been fully evaluated.

### 4. Effects of Processed Shale

In discussing the properties of the processed (retorted) oil shale, it acknowledged that this material, when leached with water, gives rise to a highly alkaline solution (I-I-23). Although a number of precautions relating to the disposal of spent shale have been discussed (I-I-38 to 52, III-III-16/17), uncertainties exist in the potential effects which could arise from water seepage through the very large amounts (I-I-24) of this material present in the environment (I-III-43/44/57). Potential adverse effects from increasing alkalinity and (or salinity) of the Colorado, Green and White Rivers are mentioned (I-V-7). In the previously issued environmental statement, the possible need for an impermeable "floor" under spent shale dumps was indicated (I-VIII-24) and apparently deleted from the statement under review. No place in the current statement are the long term (many decade) potential impacts of large scale oil shale development on the Colorado River Basin discussed in the detail which should be required considering the widespread effects of the possible pollution of this vital water resource.

### 5. Water Resources

On the basis of the document references given below, consideration has been given to the disruption of local water resources by oil shale recovery processes, especially those utilizing surface and room-and-pillar mining. However, the extent of this potential disruption by full scale resource development has not been detailed in a conservative way in the reference statements. It is clear in the case of Colorado's Piceance Creek Basin that disruption of subsurface and surface water resources could eliminate the area's wildlife potential, and essentially destroy the ranching industry which currently flourishes in the Basin. The suggested monitoring of groundwater quality (I-IV-13) would be a necessity; however, by the time some effect would be discernible, it could well be too late to institute remedial action. The environmental statement indicates that a "knowledge of aquifer characteristics... is inadequate and the extent of this impact cannot be predicted" (I-V-4). It is not clear how this potential disruption in the area's present economy and

life-style should be factored into a cost-benefit analysis of the oil shale leasing or development program. (References include I-I-53/54, I-III-28/37/41/43/56, I-IV-11/14/18, I-V-4, I-VII-5, III-II-30, III-IV-17/18/21/22.)

6. Surface Subsidence

Although the possibility of surface subsidence from room-and-pillar mining is discussed, the extent of such subsidence considering the large thicknesses of shale in some areas (III-II-44) is not indicated (III-IV-10). Also, the seismicity of the area and the degree of fracturing of the oil shale - both factors in possible surface subsidence - should be discussed in the statement.

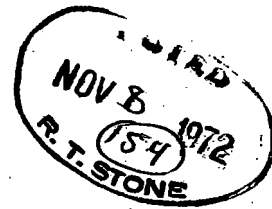
7. Endangered Species

Although a few rare and endangered species in the areas of interest are mentioned (III-II-63 and III-IV-43/43), no comprehensive listings are given in the appropriate sections of the statement. Likewise, the effects of the proposed actions on these species are not given.



LETTER NO. 14

THE ASSISTANT SECRETARY OF COMMERCE  
Washington, D.C. 20230



November 6, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

The draft environmental impact statement for the Proposed Prototype Oil Shale Leasing Program, which accompanied your letter of September 6, 1972, has been received by the Department of Commerce for review and comment.

The Department of Commerce has reviewed the draft environmental statement and has the following comments to offer for your consideration.

With respect to the possible project effects on seismicity, none of the methods of mining are likely to have very important effects on major tectonic forces so as to change the likelihood of large earthquakes in the areas under consideration. One possible exception to this is in the case of insitu mining. It is possible to conceive of a system which might pump fluids under very high pressures into faulted areas so as to change the frequency of earthquakes as the USGS has done in the Rangely oil fields near one of the proposed lease areas. But even so, these would likely be only minor changes since the proposed areas are in Risk zones 1 and 2 are not believed to encompass major fault areas. In any case, details of the insitu processes are not developed so no detailed arguments against them can be stated at this time.

Underground mining for oil shale, the one most likely to be employed, would likely be very similar to coal mining. Both operations cause small tremors from blasting and both are likely to be dangerous because of rock bursts caused by local stress changes. Neither are likely to cause major earthquakes because their coupling into major tectonic systems can be only very minor.

We find the treatment of air pollution in the subject impact statement to be too conjectural to allow thorough analysis; therefore, we are unable to reach any conclusions concerning the effects of the processing plants on air quality. For example, the discussion of stack gases in Volume 1, page III-47, is not sufficiently factual to allow objective evaluation. Further, the terming of 40 tons of "fugitive" dust per day from the eleven plant sites as "manageable" in Volume 1, page III-50 should be substantiated. The contention that fugitive dust from oil shale will tend to collect and settle in the vicinity of the plant itself is unsubstantiated. Since dust particles occur in a wide spectrum of sizes, there is no a priori reason why at least some dust could not travel considerable distances downwind. In the absence of either modeling information or data, this is an unwarranted assumption.

Concerning the discussion of the cumulative impact of the project on air quality in Volume 1, page III-53, the location of plants on upland surfaces will not necessarily be an effective preventive measure in hilly terrain. The degree to which the Rangely, Colorado population center would be affected should be considered in greater detail. The meteorological dispersion of air pollutants in Wyoming should be subjected to close analysis. The expectation that the predominantly westerly winds over the Kinney run would fan stack plumes out in the prevailing wind direction is a conjecture which may not be borne out by observation.

We hope these comments will be of assistance to you in the preparation of the final statement.

Sincerely,



Sidney R. Galler  
Deputy Assistant Secretary  
for Environmental Affairs



LETTER NO. 15

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION VIII  
FEDERAL OFFICE BUILDING  
19TH AND STOUT STREETS  
DENVER, COLORADO 80202

NOV 3 1972

OFFICE OF THE REGIONAL DIRECTOR

Re: Draft Environmental Statement  
for the Proposed Prototype Oil  
Shale Leasing Program

The Secretary  
Department of Interior  
Washington, D.C. 20240

Dear Secretary Morton:

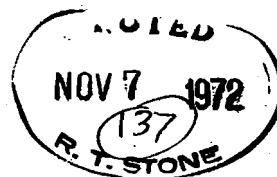
We have reviewed the above referenced statement as submitted to our Department and have no adverse comment regarding areas of responsibility under our programs. (However, it should be noted that we do not possess the expertise to be familiar with this type of operation, and it is difficult to assess the social impact of such a leasing.)

Thank you for submitting the statement for our review.

Sincerely,

*Rulon*  
Rulon R. Garfield  
Regional Director

cc:  
Robert Lanza/HEW, Wash.D.C.







DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
FEDERAL BUILDING, 19th AND STOUT STREETS  
DENVER, COLORADO 80202

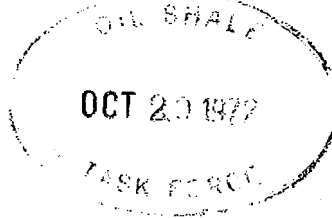
October 19, 1972

REGION VIII

IN REPLY REFER TO:

8M

Mr. Henry O Ash  
Deputy Oil Shale Coordinator  
Department of the Interior  
Denver Federal Center  
Building 56, Room 237E  
Denver, Colorado 80225



Dear Mr. Ash:

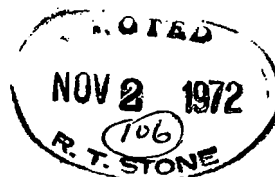
Subject: Comments on Draft Environmental Statement  
Proposed Prototype Oil Shale Leasing Program

We have reviewed the subject Draft Environmental Statement which was received in this office on September 15, 1972.

This Environmental Statement does not reflect adequate evaluation of the impact of the proposed project in the urban environment nor does it provide sufficient information to enable us to evaluate this aspect of the project. As you know, HUD is primarily concerned with (1) the effect of a proposed action on the urban environment and (2) the consistency of such action with the comprehensive planning for the area.

A basic inventory should be made of the existing facilities in the affected communities. What needed facilities are available; i.e., hospitals, water, sewer, library, schools, fire and police protection, housing, etc.? What is the existing capacity and existing demand? Based on the projected influx of population in each community, what additional facilities or increased capacity is needed?

How will the additional facilities be financed? The draft statement acknowledges that there will be a lag between outlay for community development and increased income from real estate taxes. Methods of alleviating this problem should be more thoroughly discussed. In addition, it is noted that an estimate was made that the income from real estate tax will be approximately \$1,000 per capita (new population). It is indicated that this income would meet the increased expense to the affected communities. It should be recognized that there is or will be a shortage of available housing in all of the affected localities. Consequently, a significant portion of the new population will undoubtedly reside in mobile homes. Since mobile homes are not taxable as real property in most jurisdictions, the \$1,000 per capita may be unrealistically high. This problem would be most acute in the communities where the need is greatest.



The statement suggests that an entirely new community with a population of up to 8,700 could be developed close to tract C-a in Colorado. The impact of this should be more fully evaluated if the development of a new community is being seriously considered. This would necessitate immediate planning and development. It would also directly affect the planning of the existing communities in the area.

It is implied in the draft statement that the various planning agencies will resolve any of the problems created by the increased population. While planning agencies in the affected areas must take positive and aggressive action, the impact caused by the proposed prototype oil shale leasing program on the quality of the human environment should be thoroughly evaluated as part of the Environmental Impact Statement.

Please refer to our February 10, 1971 letter to Mr. Val Payne, then Deputy Oil Shale Coordinator, which recommended the same type of information and evaluation requested above. If you have any questions on this matter or need any assistance, please let us know.

Sincerely,



Michael T. Kastanek

for Assistant Regional Administrator  
Community Planning and Management

LETTER NO. 17



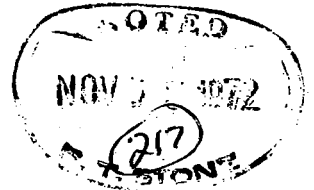
OFFICE OF THE DIRECTOR

DEPARTMENT OF THE NAVY  
NAVAL PETROLEUM AND OIL SHALE RESERVES  
WASHINGTON, D. C. 20360

Serial: 510

DEC 1 1972

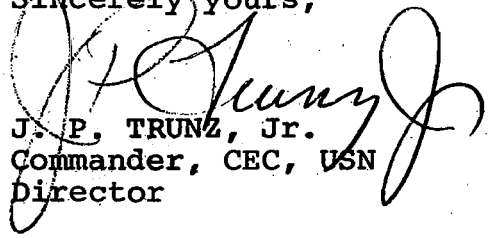
Mr. Reid T. Stone  
Oil Shale Coordinator  
Rm. 7000  
U. S. Department of the Interior  
Washington, D. C. 20240



Dear Reid:

I have received and reviewed your draft "Environmental Statement For The Proposed Prototype Oil Shale Leasing Program". I do not have any substantive comments or suggested changes to the statement; but I do wish to commend you on a comprehensive effort on a difficult job.

Sincerely yours,

  
J. P. TRUNZ, Jr.  
Commander, CEC, USN  
Director

CHARLES A. VANIK  
TWENTY-SECOND DISTRICT, OHIO

2463 RAYBURN BUILDING  
WASHINGTON, D.C. 20515  
(202) 225-6331

MEMBER: COMMITTEE ON  
WAYS AND MEANS

LETTER NO. 18

107 OLD FEDERAL BUILDING  
PUBLIC SQUARE  
CLEVELAND, OHIO 44114  
(216) 522-4253

**Congress of the United States**  
**House of Representatives**  
**Washington, D. C.**

SUITE 222  
5031 MAYFIELD ROAD  
LYNDHURST, OHIO 44124  
(216) 522-4252

October 23, 1972

Action Office MR  
For info only LM

PEP  
Reid Stone, R, 200  
PDC-Kelly  
CH  
Hughes  
4/15

Mr. John W. Larson  
Assistant Secretary of the Interior  
Program Policy  
Department of the Interior  
Washington, D. C. 20240



In Re: Environmental Impact Statement  
Prototype Oil Shale Leasing  
Program.

Dear Mr. Larson:

Earlier this year, I introduced legislation to provide for environmental safeguards in the development of the Oil Shale lands of the United States. A second piece of legislation was designed to protect the public's interest in the exploitation of this land which contains about two trillion barrels of oil, with a present day market value of approximately \$8 trillion.

In addition, I share the interest of many in the Congress for the development of a comprehensive and adequate energy policy which will meet the needs of our nation in the centuries to come.

In reviewing the three volume draft environmental statement for the proposed Prototype Oil Shale Leasing Program, a number of issues seem to be unresolved.

First, does the Department have the authority to require the environmentally sound development of the 20% of the oil shale lands in the Western States which are privately owned? Even if the public lands are carefully developed, the uncontrolled development of the remaining land by

private interests could create irreversible damage to the environment of the Rocky Mountains and Colorado River Valley. (Vol. II,64; Vol. I: III,88)

Second, what is the anticipated damage to the Colorado River below the Boulder Dam? While the draft statement discusses the problems of water degradation, reduced water flow, and ground water contamination in the oil shale area and southward to Boulder Dam, there is no mention of the severe environmental effects that the development of this resource may have on the water of the lower Colorado River. As you know, the diversion of water in the upper reaches of the Colorado has already had a severe effect on the water of the Colorado along the Mexican border. Reduced river flow has increased the salinity level in this area, with the result that has caused serious agricultural damage to both our own farmers and to adjacent areas of Mexico. Needless to say, the diversion or degradation of additional waters from the Colorado, raise serious international questions and could, in fact, be a violation of our treaty agreements with Mexico. (Vol. I: VIII,26; I, 46,50; III, 39; V,3)

Who will bear the cost of providing for the water and the environmental repair of the oil shale region? In sum, what will be the total cost to the American public of the development of this area by the oil companies for their private profit? It is not clear from the draft statement, but it appears that the American taxpayers will make substantial contributions to the oil companies for the development of this vast treasure. (Vol. I: I,52)

For example, who will maintain the re-vegetation projects after the oil companies have left? Who will ensure that erosion control projects are maintained? Who will ensure that the pillars in underground mines are maintained so that massive land subsidence is avoided? Who will construct the dams and waterways to provide water for these projects? It is anticipated that up to 80,000 to 125,000 acre feet of water will be taken from the Colorado river basin each year for use in oil shale development. But the upper reaches

Mr. Larson  
October 23, 1972  
Page Three

of the Colorado are already failing to provide the amount of water which has been committed for use in the southern states of the Colorado Basin.

As an example of the existing water problem, two weeks ago, the Congress passed a bill providing for the authorization of additional Bureau of Reclamation projects; one of these projects was the Closed Basin Division of Colorado's San Luis Valley Project. This project has an initial estimated cost of over 18 million dollars and is designed to deliver water to the Rio Grande for subsequent utilization in the states of Texas and New Mexico. The program will enable the state of Colorado to discharge its obligations under the Rio Grande compact without disruptive influence on existing water uses in Colorado and will enable the United States to meet its treaty commitments to the Republic of Mexico. Since there is already a shortage of water flow to areas south of the state of Colorado, the public is entitled to know whether the San Luis and other reclamation projects are being built at public expense to ensure the development of the oil shale lands by the oil companies. Should not a large part of the cost of these water diversion projects be borne by those who are seeking to develop this land for private gain? (Vol I:II,22, 110; III,23: V,3)

In Volume III of the study, provisions are outlined which provide for a system of rental, royalties, and bonding in the leases so as to ensure minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area. These provisions seem so weak that they may not only be ineffective in guaranteeing the reclamation of these lands, but will also constitute a give-away of the public domain to the future profit streams of a few companies.

The annual rental fee of 50¢ per acre seems outrageously low. This means that the 5120 acres considered in this project will be leased for \$2500 for the first

Mr. Larson  
October 23, 1972  
Page Four

year --- or the cost of a small compact car. The insult to the American taxpayer is compounded when the leasing company deducts this \$2560 from their federal income tax as a cost of doing business.

The royalty for this Prototype program could be as low as 12¢ for each ton of oil shale mined for processing that contains 30 gallons of shale oil per ton of material. This royalty fee is not only low; it is also tax deductible. It would seem that the profitability of this oil shale development will be rather substantial. Could profitability estimates be included in the final draft of this report?

In another part of this study, the point was made that costs should be kept down for the industry developers so as not to create an undesirable economic burden on the developers of this project.

In light of present Federal tax benefits and subsidies --- oil depletion, investment credit, ADR, and business deductibles, it seems that with low fees described in the report that the oil companies could make this a "total tax shelter" program.

A major danger in the 20 year term agreement stems from the fact that re-adjustment of royalty and operating terms may be made only at the end of the 20 year period. At the end of 15 years, the profits from oil shale may be fantastic --- yet the public will be stuck with the pittance of this "royalty lease" arrangement.

This project not only provides inadequate environmental protections as earlier pointed out, but it sets the stage to sacrifice the American taxpayer on the altar of corporate profits.

The reclamation bond in the draft study is established at \$500 per acre --- a totally inadequate figure. The cost of reclaiming an acre of West Virginia strip mined land is estimated to run as high as \$2700. The \$500 bond could be paid as a cost of doing business, environ-

Mr. Larson  
October 23, 1972  
Page Five

mental repair avoided, and the company would still be financially ahead of the game. This bond is much too low to provide any environmental incentives. In addition, under the terms of the lease, extraordinary environmental costs can be credited against royalty payments due to the government.

In sum, the whole contractual arrangement provides no environmental protection to damaged land and should be re-drafted to protect both the land and the public interest.

In addition, the project should not proceed until standards and regulations are established by Congress. It makes no sense to proceed with this project on a crash basis until the issue of strip mining and mine reclamation --- certain to be considered by the next Congress --- are resolved through legislation.

At the present time, some 3.2 million acres of American land have been devastated by strip mining. The environmental consequences of such strip mining are referred to in Volume II, pages 145 ff. Despite the damage caused by surface mining, and increasing moves in the Congress to control such operations, the Department plans at least one surface mine in operation by 1981 with apparently more later. (Vol. I: III-6)

The first open mine will be in Colorado. It has long been recognized that strip mining is most serious where the terrain is steepest. The soil mapping unit description for the Colorado area is as follows:

"Landscape: The unit consists of steep lower mountain slopes of rugged relief dissected by narrow valleys and streams. The sharp ridges of the Grand Hogback are representative or portions of this unit.

"Slopes: Steep slopes with gradients between 10 and 60 percent are most common. Gradients of less than 10 percent are generally limited to colluvial slopes, swales, fans and alluvial bottom-lands. (Vol.I:II-79,81



Mr. Larson  
October 23, 1972  
Page Six

In light of the geologic description, does the Department intend to limit strip mining to flat plateaus and valley bottoms--or will these steep mountain sides be torn open?

In addition, would strip mining be avoided in highly erodible areas? For example, the sites in Utah are said to contribute a high silt load to the Colorado River system. One area under consideration is classified as having 337,000 acres, of which 64% is in a "critical" erosion category and 27% in a "severe" erosion classification. Open mining in an area such as this should certainly be avoided.

It is a duty of the Department to ensure the efficient utilization of the mineral resources of the United States. I am concerned about indications in the Environmental Impact Statement that only the most readily accessible oil shale will be mined while the lower grade shale, which contains billions upon billions of barrels of oil, may be lost or buried under thousands of tons of scrap. The various methods of mining the shale do not appear to be particularly efficient. For example, in situ mining is estimated to recover approximately 50% of the oil potential; deep mining will only recover 50-65% because of the need to leave pillars.

It would be my hope that the Department would require a higher degree of efficiency in the development of this public property and natural resource. Leases for the mining of oil shale should require a minimum level of potential oil recovery.

The most shocking and disturbing section of the draft environmental report is Volume II, which deals with energy alternatives. This volume attempts to show that the one million barrels of oil per day estimated to be available from the six oil shale leases by 1985 is absolutely essential for the Nation's energy needs.

In this volume, the Department systematically reviews alternative forms of energy supplies and discusses their

Mr. Larson  
October 23, 1972  
Page Seven

potential environmental costs. I am very disturbed by the lack of imaginativeness in discussing new, clean sources of energy which would meet the power demands of our Nation for centuries to come. While the energy development authority of the Federal government is chaotically divided among government departments, agencies and commissions, it is obvious that the role of the Department of the Interior in meeting the future energy needs is a paramount one --- but the Department apparently has no real policy for the future.

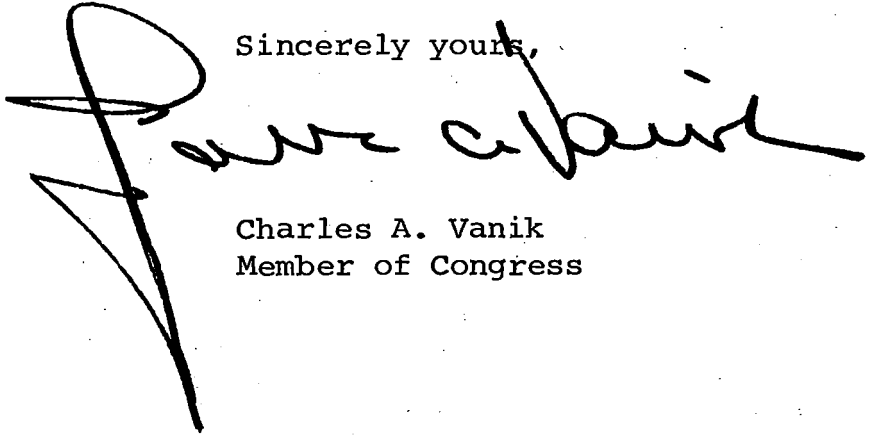
This can be seen by comparing the table on page 12 of Volume II with the Table on page 203 of that same volume. The first table indicates that between 1971 and 1985 the energy demands of the country will grow from 68,975 trillion British Thermal Units per year to 133,396 trillion BTU's --- an increase of 64,421 trillion BTU's or nearly 100%. Yet the second table shows that under the most optimistic of estimates, the potential increase in BTU's, through the expansion of all forms of energy, increased energy imports, and the reduction of energy demand, will only amount to 17,155 trillion BTU's --- 25%. The gap between the Nation's energy demand and energy supply will be nearly 50,000 trillion BTU's. This shortage, according to the Department, will occur within the next fourteen years --- and yet the Department describes no policy for achieving the needed energy supplies. Since the conventional sources of energy will fail to meet our needs, I would hope that the Department would explain what exactly is the government's policy toward the development of adequate, clean energy supplies.

It would appear that the Department has demonstrated that it is absolutely essential that the oil shale lands be developed immediately, regardless of environmental consequences. But the Department has painted such a dark picture that it has made the contribution of the oil shale lands appear rather insignificant. For example, by 1985, the country will need 23.56 million barrels of oil per day. At that time, it is expected that the oil shale lands will be producing a million barrels per day ---

48  
Mr. Larson  
October 23, 1972  
Page Eight

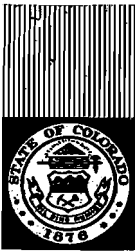
or about 4% of our daily needs. In light of this small percentage, it would appear that we can take the time to be certain that the development of this oil shale land is carried out in the best possible manner for the benefit of all the American people.

Sincerely yours,

A large, stylized handwritten signature in black ink, appearing to read "Charles A. Vanik". The signature is written over the typed name and title.

Charles A. Vanik  
Member of Congress

CAV:lnm



LETTER NO 19

STATE OF COLORADO DEPARTMENT OF HEALTH

4210 EAST 11TH AVENUE • DENVER, COLORADO 80220 • PHONE 388-6111

R. L. CLEERE, M.D., M.P.H., DIRECTOR

November 3, 1972

OFFICE OF

NOV 6 1972

(131)

HEARINGS & APPEALS

James M. Day, Director  
Office of Hearings and Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

The Colorado Department of Health appreciates the opportunity to comment upon the Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program. Comments on the statements have been solicited from key technical personnel within the Department of Health. The comments are summarized and attached, along with the appropriate regulations that must be observed to maintain the quality of the Colorado environment.

Perhaps the strongest recommendation the Colorado Department of Health can make would encourage the Department of Interior, as guardian of the public domain, to assess the practicality of oil shale development basing a judgment on fact and not on theoretical or experimental proposals.

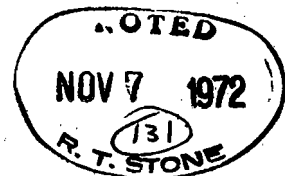
If the Colorado Department of Health may be of further assistance or supply additional information, please call on us.

Sincerely,

Roy L. Cleere, M.D., M.P.H.  
Executive Director

RLC:LF  
Enclosures

cc: Governor John A. Love  
J. D. Arehart, Department of Local Affairs  
T. W. Ten Eyck, Department of Natural Resources  
Phillip Schmuck, Director, Division of Planning  
Robert Bronstein, Coordinator of Environmental Problems



The Department of Interior should solicit specific proposals from the petroleum industry on mining, processing, and economic feasibility of an oil shale development program before public lands are leased to private industry. As guardian of the public domain, the Department of Interior should assess the practicality of oil shale development, basing a judgment on fact, and not theoretical or experimental proposals.

The deficiencies in the Environmental Statement as relating to the air quality are discussed below:

#### A. Mining

##### 1. Open-pit mining

The discussion of the location of an overburden storage area is limited to a few statements indicating intent to see environmental considerations are met. Removal of from 0 to 1500 feet of overburden, and storage (for several years, but not specified) of overburden would require methods of controlling dust for the removal, transport and storage areas of overburden. Strict control of fugitive dust is required by Colorado Air Pollution Control Regulations. The same fugitive dust, as well as particulate, emission standards apply to the blasting, conveying, crushing and sizing operations. In Volume I, page III - 50, the Statement reads, "at each of the projected eleven plant sites comprising a one million barrel per day industry, assuming 98 percent primary dust capture efficiency, there could be up to 40 tons of "fugitive" dust per day. This is a manageable quantity , ....." Obviously, the statement quoted is incorrect. Forty tons of fugitive dust per day would result in over 14,000 tons of particulate per year, with that alone qualifying the operation as a major source of air pollution in Colorado. Not an unmanageable quantity of air pollution.

##### 2. Underground mining

Although the overburden would not be disturbed with underground mines, the same conveying, crushing and sizing operations would take place. In addition, the vents of the underground mines would have to meet emission standards, as any stack must comply with air pollution control regulations.

#### B. Extraction Processes

##### 1. Retort process

The actual retorting process that would be used is not identified, however, in Volume I, page I-14, the statement does generalize about the procedure, "All retorting processes have one fundamental characteristic in common; namely, heating the shale to at least the pyrolysis temperature, which ranges from 800° to 1,000° F. This is the only practical means known for producing shale oil. Although the major pyrolysis product is oil, both gas and carbonaceous residue also are formed." The statement neglects to mention that

pyrolysis also produces carcinogens, or cancer-causing agents. Adequate means of removal of carcinogens and other hydrocarbons is not discussed. Both Federal and State air pollution control agencies have rules and regulations that require maintenance of National Primary Air Quality Standards, by having the power to grant a Permit to Construct, and a Permit to Operate.

## 2. In Situ process

In situ processing is at best in the theoretical stage of development. This evaluation is also presented in the statement, Volume I, page I-5, "In situ processing is in the experimental phase; commercial application of this technique cannot be expected prior to 1980." Therefore, the probability of use of the retort process is greatly increased for the duration of the prototype program.

## C. Disposal of Spent Shale

As was mentioned above, the prototype program will employ the retort method of oil extraction. This method does require the mining (either underground or surface method) of the shale, chemical extraction of the oil, and pipeline removal of the shale oil to commercial centers for eventual sale.

Volume I, page III - 15 states, "Processed spent shale occupies a greater volume than the original rock in place; therefore, only part of the waste could be returned to the mine. With compaction of the waste it is estimated that 60 to 80 percent could be returned underground. During the operation at any lease site, part of the waste (20-40%) would therefore need to be disposed above ground." According to Table III-3, Land Requirements for Oil Shale Processing, Volume I, surface mine processed shale will require 140-150 acres per year for permanent disposal, or for a more visual description, Volume I, page III-12, "During full scale operations, /of a 100,000 bbl/day plant / 74,000 tons per day of processed spent shale would be produced at a typical plant. At full capacity, such a plant would disturb about 70-75 acres per year, if a dry canyon in the shale area were filled to a depth of 250 ft." On the next page, III-13, restoration is assumed to proceed as soon as the ultimate height of the waste disposal pile had been reached for a specific canyon. Three years thereafter, the area is assumed to have been revegetated." For a minimum of three years, a pile of spent shale is left to the elements (wind, erosion) to maintain the integrity of the surface. Since wind is common in the western slope of Colorado, it is probable that the fine particles of spent shale will become wind-borne, and will again create a fugitive dust source.

## D. Degradation of Air Quality

Volume I, page III-52, "The impact of this cumulative loading on ambient air quality cannot be determined with available data, but will tend to reduce the average annual visibility." (Emphasis added) Volume I, pages III-53, V-5, "The long term effect of industrialization in the region would result in a decline in general air quality." A degradation

of ambient air quality is specifically forbidden as stated by the Colorado Air Pollution Control Commission (established by the Colorado Air Pollution Control Act) in the Non-degradation Clause," It is hereby declared to be the policy of the State of Colorado that in those areas where existing air quality is better than ambient air quality standards, such existing air quality will be protected, and significant degradation of Colorado's air resource will be prevented. In furtherance of such a policy, potential new sources of air pollution will not be allowed to significantly endanger maintenance or attainment of local, State, or Federal ambient air quality standards and existing sources shall be required to do the same by 1975.

Volume II of the Impact Statement discusses the need for additional fuel reserves, and energy alternatives.

The following are a series of direct quotes from Volume II, titled "Energy Alternatives of the Environmental Statement for the Proposed Prototype Oil Shale Leasing Program." The first quote is on page 41: "Production of crude oil from known reservoirs, therefore, depends on both technology and oil crisis. Higher prices and/or improved technology would make it profitable to extract substantial amounts of additional oil from fields now economically marginal. Our ability to continue to advance technology and the economic availability of the energy supplies from oil shale, coal, and tar sands will determine future price relationships for energy sources."

The next quote is on page 114: "It is highly unlikely that air quality reductions from operations associated with increased petroleum production would significantly alter biological conditions affecting the growth of flora. The feeding and nesting habits of birds and animals, wilderness qualities and hunting could be altered by the result of noise and vibrations associated with increased petroleum operations. At the termination of operations, a reversal to the original conditions would be expected."

Volume III of the Environmental Statement for the Proposed Prototype Oil Shale Leasing Program is entitled Description of Selected Tracts and Potential Environmental Impacts. The legal description of Colorado Tract A in Township 1 and Township 2 South, Range 99 West comprising 5,130.4 acres. Colorado Tract B in Township 3 South, Range 96 and 97 West comprises 5,113.9 acres. Colorado Tract B is close to the Piceance Creek. The elevation of Tract A ranges from 6600 feet to 7400 feet. The elevation of Tract B ranges from 6400 feet to 7100 feet. The climatological discussion of Tract A is limited to probable amounts of rainfall and snowfall per year, probable temperature ranges and probable prevailing wind directions and wind flow patterns. Quote from Volume III, page II -- 26: "Night-time temperature inversions occur with high frequency over the Piceance Creek Basin in the lower few hundred meters above the terrain because of strong radiative cooling in a rather dry atmosphere." The same climatological discussion is presented for Colorado Tract B.

It discusses the options available for the actual mining development of these tracts in 3 states. In Colorado, Tract A is described as being feasible for mining oil shale from open pit and underground mines or from in situ processes. Colorado Tract B is described as being suited primarily for underground room-and-pillar mining. The portion of the Environmental Impact Statement that discusses

the environmental impact of the proposed action lists certain emissions from the general plant complex. It is listed on page IV--32 of Volume III: "Combined residual concentrations of sulfur would be 57 to 85 tons per day, and 21 to 29 tons of NO<sub>2</sub> would be emitted. Up to 40 tons of dust per day may also be emitted from each mining surface processing complex. The impact of these emissions on ambient air quality has yet to be established. An additional statement on the impact of the environment occurred in Volume III, also, page IV--51: "The clean air may be degraded by dust from waste or vehicles. Impacts from the mine and retorts may not be significant in the immediate area during the summer months since normal corrective lifting will put particles into prevailing winds aloft. However, inversions during the winter months may trap and concentrate emissions over the Piceance Basin and could result in further accumulation of particulate contaminants. Dust from the spent shale disposal area on Douglas Creek, under night-time inversions which are common in the drainage area during the summer, could result in increased air pollution if not properly controlled." In the general discussion of a 100,000 barrel-per-day plant, the surface mining discussion describes a schematic layout of a retorting system that is capable of handling 505 tons of oil shale per hour. Volume III, page III--20: "The overall dust losses in the crushing and screening operations are estimated to be 1.3% of the shale handled. Half of this loss is assumed to occur in crushing and transporting, and the balance in screening." For a process rate of 505 tons per hour, Colorado Air Pollution Control Regulation I provides a process weight rate loss (allowable emissions in terms of pounds per hour) of 45 pounds per hour. According to an estimated loss of 1.3%, a single prototype retorting plant would emit over 13,000 pounds per hour, which is of course a violation of Regulation I. A copy of the oil shale lease appears in Volume III of the Impact Statement. Quoting Section 5 verbatim: "Protection of the environment, non-mineral resources, and improvements, and reclamation of lands and waters. The lessee agrees: (a) to meet all requirements formulated in accordance with Regulations 30 CFR Part 231 and 43 CFR Part 23, for the preservation and protection of the environment, including land, water, and air, for the protection and conservation of non-mineral resources during the conduct of exploration or mining operation, and the reclamation of lands and waters affected by exploration or mining operations, including in situ operations. (b) in addition to meeting the requirements specified in paragraph (a) hereof, to conduct exploration or mining operations in compliance with all applicable federal, state, and local water pollution control, water quality, air pollution control, and air quality standards in existence upon the effective date of this lease or thereafter promulgated." The signing of this lease demands that the lessee comply with all Colorado air quality emission and ambient air quality regulations. A copy of the current regulations is attached.

Prepared by:  
Lindsay Tipton  
Planning Section  
Air Pollution Control Division  
Colorado Department of Health  
November 3, 1972



November 2, 1972

REVIEW OF  
ENVIRONMENTAL IMPACT STATEMENT

Unfortunately, this office did not receive a copy of the ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM until quite recently, so these comments will be brief.

First, in looking at the effects of oil shale lease development, the statement concludes that "...water contamination due to leaching will be negligible."<sup>1</sup> This statement was based on a report developed by Colorado State University.<sup>2</sup> This report was less certain about the lack of water quality degradation from spent shale than is indicated by the above statement. They concluded that:

"Leaching tests show that there is a definite potential for high concentrations of  $NA^+$ ,  $CA^{++}$ ,  $MG^{++}$ , and  $SO_4^-$  in the runoff from spent oil shale residues. However, with proper compaction, the piles become essentially impermeable to rainfall. On the other hand, snowfall eliminates the compaction in the top foot or so, and at least the top 2 feet of the residue becomes permeable to water."<sup>3</sup>

The first portion was quoted in the Impact Statement; the underlined portion was not included. The concentrations of ions in runoff from the spent shale can be expected to decrease with time, but how rapidly is still in question. During the summer period in which the C.S.U. study was conducted, they noted "...no observable decrease in the leaching characteristics of the outdoor oil shale residue...."<sup>4</sup> This indicates the potential for water having passed thru the spent shale containing suspended and dissolved solids at much higher than ambient levels for many years, if not decades. The control procedure outlined in the Impact Statement is the construction of a small dam or retaining pond below the spent shale to capture this water which is then to be reused in processing.<sup>5</sup> What is to be done with this water after the oil shale is depleted and the site abandoned? Vegetation alone cannot prevent erosion and leaching. This somewhat parallels the current problem of acid mine drainage

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<sup>1</sup>ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM, Vol. 1, Page 1-43

<sup>2</sup>WATER POLLUTION POTENTIAL OF SPENT OIL SHALE RESIDUES, C.S.U., Dec. 1971

<sup>3</sup>I.B.I.D., Page 1

<sup>4</sup>I.B.I.D., Page 58

<sup>5</sup>ENVIRONMENTAL STATEMENT, Vol. 1, Page 1-42

in which a measureable water degradation is produced by man-made sources after a site is abandoned. The location of disposal sites in canyons maximizes the potential of leaching by placing the waste in a water collection basin. Has any thought been directed towards developing disposal sites on high ground, artificially stimulating cementation in the residue, or artificially leaching the residue until the runoff and leach water is at least no worse than existing waters? I found no mention of alternate surface disposal methods in the Impact Statement.

Diversion of water for processing and discharge of low quality processing and dewatering liquid will have a detrimental impact on water quality in the White and Colorado Rivers. As noted in the Impact Statement, current water quality in both the Colorado and White Rivers is very good,<sup>6</sup> but it might be well to note that the White River is classified as a potable water supply as far as Rangely, Colorado. The classification carries a restriction that total dissolved solids remain below 500 mg/l as measured by a yearly volume weighted mean. This could be violated by the discharge of low quality processing water. The Impact Statement predicts the effects of consumptive withdrawal on the impoundment at Hoover Dam<sup>7</sup> but no prediction is made of the effect on waters in the Colorado and White Rivers. All of the Colorado and Utah prototype leases and most of the full scale sites will discharge to the White River which could place an intolerably large burden on it. Again the statement must be qualified since not enough data is given (or presently known) to give numeric values for their effect.

The effect of lease development on subsurface waters is even more difficult to evaluate from the information given. Dewatering is expected to increase the dissolved solids concentration in the aquifer until the water is no longer useable in processing,<sup>8</sup> presenting the problem of what to do with this liquid. Subsurface discharge would only compound the problem. More detailed information on aquifer characteristics in the Piceance Creek Basin is being developed for the Regional Oil Shale Study but will not be available until 1974.

The additional domestic waste water load presents no technical difficulty but municipal facilities in nearby communities should be expanded to meet the increased load before it occurs.

*John R. Hinton*

John R. Hinton  
Planning Section

JRH:dls

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<sup>6</sup>ENVIRONMENTAL STATEMENT, Vol. I, Pages 11-73, 74

<sup>7</sup>I.B.I.D., Vol. III, Page IV-30, Vol. I, Page VII-39

<sup>8</sup>I.B.I.D., Vol. I, Page III-31

INTER-OFFICE COMMUNICATION

TO : Lindsay Tipton

DATE : November 2, 1972

FROM: Albert J. Hazle

SUBJECT: Comments on Draft Environmental Statement for the Proposed

Prototype Oil Shale Leasing Program

Because the use of nuclear devices is not specifically proposed, our comments are not voluminous. However, due to the volume of shale to be processed and the volume of wastes generated and their disposal, it is absolutely imperative that concentrations of naturally occurring radioactive materials be identified in the following items:

- 1) The raw material,
- 2) the various finished products in which these materials may concentrate, and
- 3) the waste material fractions.

I am sure that Water Pollution would also be interested in the materials (radioactively stable and unstable) that could leach from these waste dispositions.

Attached is a summary of the draft statement, prepared for our Division by Bel Evans, which may be of some value to you.

AJH/pl  
Enclosure

  
\_\_\_\_\_  
Signature

INTER-OFFICE COMMUNICATION

TO: R. D. Siek, A. J. Hazle

DATE: October 17, 1972

FROM: Bel Evans

SUBJECT: Comments on Draft Environmental Statement  
for the Proposed Prototype Oil Shale  
Leasing Program

Volume I Regional Considerations

I. Description of the Proposed Action

Up to six leases of about 5,000 acres each will be let on competitive bonus bidding, with the U.S. to receive royalties on production.

Colorado's deposits are primarily in the Piceance Creek Basin, with small deposits in the Battlement Mesa and Grand Mesa regions.

Most experience, except for the Rifle facility has involved strip mining. Dust evidently will be an undesirable result of the operations. Individual retorts for this program are expected to have a capacity of about 10,000 tons per day, with about 13-14% of this being organic matter. Compare this with the plant at Rifle built in 1966-67 with an original capacity of 150 tons per day. Union Oil had a demonstration unit operating from 1956 to 1958, capable of handling 1000 tons per day. The gas produced has a low heating value, but is economically useful for operating the plant. Temperatures in the retorts are in the 800-1000°F range. Sulfur control will be required to meet air quality standards. 2-5 gallons of water would be produced normally per ton of ore, with some ores yielding up to 10 gallons per ton. This water is definitely not up to drinking standards, and will require additional treatment if it is to be released into streams.

The spent shale weighs about 80-85% of the original material, but its volume will be about 12% greater than the original material. Parts of it will be highly alkaline, and care will be required to prevent leaching into streams.

As by-products the study points out the existence of large deposits of dawsonite (an aluminum bearing mineral) and nahcolite (a sodium mineral) in the Piceance Basin. These materials make up as much as 20% of the total weight of the shale.

Experiments with in situ retorting have not shown promise to date.

Expended shale tailings have a cement-like characteristic and can be compacted easily. The principal problem with the tailings will be leaching of  $\text{Na}^+$ ,  $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$ , and  $\text{SO}_4^{--}$ . If the sands are processed for the removal of alumina and soda ash, the residue will be in the form of a slurry, requiring removal and treatment of water. There definitely exists a potential for adding to the salinity of nearby streams. Figures quoted for a 50,000 bbl/day plant include:

- a. About 1600 tons of chemicals (catalysts) per year.
- b. 27-30 million tons spent shale per year.
- c. Water requirement of 8.5 cubic feet/second, or 30600 per hour, or 73,440 cubic feet or nearly 17 acre-feet per day.

The study points out the need for an expanded water sampling program and the need for sulfur and oxides of nitrogen removal from effluent gases.

50,000 bbl/day is considered the production rate for a minimum-sized commercial plant.

## II. Description of the Environment

"In the shallow valleys and low ridges of parts of the... Piceance Creek basin there are no prevailing winds." However, at 10,000 feet the Rio Blanco Environmental Statement shows 46% of winds from the west and southwest. Air inversions are common at night.

80% of the known higher grade reserves of the Green River formation are in Colorado. The oil shale bearing rock layers range from 3000 to 7000 feet thick. In Colorado the strata vary from 10 to 2000 feet thick for the best shale, with overburden varying from zero to 1600 feet.

The two sites currently under consideration are in the White River drainage basin. Rainfall in this area averages between 12 and 24 inches annually, with some flash flooding occurring in late summer.

"A supply of surface water large enough for mines and retorting plants is not present in the streams of the Piceance Basin." Water, therefore, would have to be obtained from the Colorado and/or White Rivers. The White River is too low several months of the year. This means that as much as 120,000 acre feet per year might have to be taken from the Colorado somewhere above Debeque.

## III. Environmental Impact

A surface mine would require the disturbance of 30-85 acres per year. This would include the disposal of about 74,000 tons per day, preferably into a dry canyon.

Flash flooding or heavy runoffs in these partially filled canyons would cause some leaching from the tailings.

The statement mentions the possibility of changes in water table levels, resulting in changes in springs and domestic wells. Their estimate on the increase in salinity at the river at Hoover Dam is 1.5%, or 6-10 ppm. An estimated increase in population of 47,000 people by 1981 would require development of water supplies and sewage disposal plants. "The long term effect of industrialization in the region could lead to some cumulative decline in water quality."

The air pollution problems are similar to those associated with heavy construction projects and the petroleum industry. The cement-like characteristics of the tailings will minimize dust from this source, but ore crushing and moving will cause some problems. Assuming that minimum standards for sulfur and oxides of nitrogen emissions are met, a maximum atmospheric loading of 230,340 tons per day of sulfur and 80-120 tons of  $\text{NO}_x$  per day are predicted. This will reduce visibility in the Basin, and may intensify the temperature inversions.

It is also noted that there would be a serious impact on the humpback chub and the Colorado River squaw fish.

Volume II discusses alternatives for meeting the energy shortage and alternatives to developing oil shale deposits other than the program outlined in Volume I.

Volume III contains more detailed information on the selected sites and their individual environmental impacts.

Site C-a is about 10 miles NW of the Rio Blanco emplacement well, and C-b is 10 miles east of the well. Both sites are owned by the State Game, Fish, and Parks Commission. The bottom of the oil shale deposits is 2,000 feet or more above the Fort Union and Mesa Verde formations, which are of interest for nuclear gas stimulation.

If local water is insufficient, a pipeline will have to be laid to the White river (18 miles for Tract A, 25 miles for Tract B) or the Colorado River. (45 miles for Tract A, 30 miles for Tract B) If the White river is selected, a reservoir will have to be constructed to take care of periods of low flow in the river. Buried pipelines would be required to assure water supply in the winter months. It should be noted that, at both sites, it is planned to lower the water table to facilitate underground operations. It should also be noted that the quality of water pumped from underground sources will gradually deteriorate in quality as saline aquifers become involved.

Three systems of processing are considered to be technically feasible:

- a. Underground mining, surface processing.
- b. Surface mining and processing.
- c. In situ processing.

a One of the features of underground mining as proposed is the use of 60% of the processed shale can be back-filled. This reduces to the problem of tailings disposal and the effect of subsidence on the surface. By reducing the possibility of shifting ground, backfilling also minimize changes in natural surface drainage and underground water movement.

b Tract C-a is the only one of the six selected tracts which appears to be suitable for strip mining. The overburden varies in thickness from 100 to 850 feet. An estimated 7.1 billion tons would have to be removed and disposed of by filling in Water Gulch, west of the site. Waste could be backfilled into parts of the pit after about 16 years.

The slurry from this operation would be pumped into neighboring canyons behind dams. The water from the slurry could be reused to some extent, but could not be released to streams. Dikes and diversion streams would have to be built around these deposits to prevent leaching of salts into the streams.

Eventually these piles could be covered and revegetation begun. However, it is possible that the buried tailings might contribute to the salinity of underground waters.

c In situ processing is still in the experimental stage, and there is no assurance that the process will prove feasible.

The effect on population of nearby cities are predicted as follows:

	Current	Future
Rangely	1500	9,350
Meeker	1500	7,650
Rifle	1500	5,500
Glenwood Springs	4100	8,100
Grand Junction	20, 170	3,000

An increase of 2000 in Debeque and Grand Valley combined.

#### Conclusions

Air Pollution The six sites together will release 57-85 tons of sulfur and 21-29 tons of NO<sub>2</sub> daily, and each site will produce up to 40 tons of dust per day. Add to this the frequency of winter inversions in the Piceance Creek Basin, and one has conditions that will produce deleterious effects on the existing conditions.

Soil Surface Development of Site C-a will disturb 1400 acres for the plant. 4850 acres will be covered by shale and overburden removed from the open-pit area. Roads and utilities will take up another 400 acres. Off-site some 175-225 acres will be disturbed during the laying of water and oil pipelines, plus right-of-way for electrical power lines. A total of about 6650 acres will be involved.

At Site C-b some 1100 acres will be involved if underground disposal of tailings is to be used. 2200 acres will be needed otherwise. If in situ treatment is feasible, only 800 acres may be required. It is possible that an additional 1000 acres might be required for tailings disposal. 200 acres off-site will be disturbed for pipelines.

Water The report lists the increase in salinity of the Colorado River at Hoover dam. It does not estimate the relatively greater effect in the White and Colorado rivers in the State of Colorado, partly due to salinity of site effluents and partly due to removal of water from the rivers for use at the sites.

Conflict with Project Rio Blanco I am not a geologist, seismologist, or mining engineer; but I do not believe that extensive mining and multiple underground nuclear shots are compatible. It appears desirable to compare the two projects for advantages and disadvantages and choose one or the other. Each one will change conditions in the Basin. Considering the non-nuclear aspects, Rio Blanco would appear to be more desirable from an environmental standpoint.

BSE/rl

  
Belmont Evans

LETTER NO. 20

DELANEY & BALCOMB

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ROBERT DELANEY  
KENNETH BALCOMB

JOHN A. THULSON  
EDWARD MULHALL, JR.  
ROBERT C. CUTTER

November 3 1972



Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd,  
Arlington, Virginia 22203

Re: Comments - Drafts Environmental Statement for the Proposed Prototype Oil Shale Leasing Program.

Dear Mr. Day:

This statement is supplemental to that given at the public hearing in Grand Junction by Roland C. Fischer, Secretary - Engineer of the Colorado River Water Conservation District on Oct. 13, 1972. It is made by such Secretary - Engineer and counsel at the direction of the District Board of Directors.

The Colorado River Water Conservation District is a governmental entity created by statute of the General Assembly of Colorado, CRS 1963 150-7-1 et seq and as such is the primary water policy body in western Colorado. The District's area is 29,000 square miles including all of twelve and parts of three counties which make up the principal head

OFFICE OF

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HEARINGS & APPEALS



waters of the Colorado River. As the principal water policy body in western Colorado, the District has considerable expertise and familiarity with the problems associated with water use in an arid region.

Over a period of many years the District has often indicated its affirmative support of an oil shale industry. This support has been exemplified in various ways including the planning of several projects designed to, in part, provide a water supply for the oil shale industry. Therefore, the District was concerned when it was not consulted prior to the presentation of the Draft Environmental Statement. It is the position of the District that the draft statement reveals the results of lack of consultation with any entity familiar with the problems associated with obtaining a water supply for a large scale industry such as the oil shale industry. The following comments should serve to exemplify the above statement.

#### WATER SUPPLY

Unless otherwise indicated where a reference is made to the Draft Environmental Statement, such is to Volume I of the statement.

The Table found on Page II-21 "Present and Future Use in the Upper Colorado River Basin (thousand acre feet annually)" deals with water supply in relation to a single point on the Colorado River. The calculations are

intended to show water availability at Lee Ferry, Arizona. At that point the water available includes waters of the Yampa, White, Main Stem of the Colorado, Gunnison, San Juan and Dolores Rivers in Colorado, plus other waters tributary to the Colorado River from other states upstream from Lee Ferry, Arizona. Much of that water would be unavailable to the oil shale industry due to its geographic location. This is not to imply that the water is not available for an oil shale industry in Colorado. The concern of the District is with delivery of the water to a point where it can be used by the industry. Consideration of this problem is not found in the draft statement. Thus, if our interpretation is correct, the Table and the draft statement tend to be misleading to the extent that it implies that all of the 159,000 acre feet of water found to be available in the statement is available to the oil shale industry in Colorado in the Piceance Basin. The District feels that this is not a realistic evaluation of the water supply picture in the region of the upper Colorado River.

There are other problems not dealt with in the draft statement that significantly affect the water supply picture in Colorado. Acting through the Justice Department, the Departments of Agriculture and Interior have filed many claims in Colorado's Water Divisions 4, 5 and 6. The United States claims include 200,000 acre feet of water from the Colorado and White Rivers for the Naval oil shale reserves.

It is our position that some consideration of these claims should be included in the statement.

At Page II-72 the following statement is made "Colorado River water is available for purchase from the Bureau of Reclamation's Green Mountain and Reudi Reservoirs." This statement completely overlooks the problems associated with the Green Mountain Reservoir and its purposes. Its capacity for storage of water to be used by the oil shale industry are affected by its purposes. The District is in contact with the Department of the Interior concerning a possible resolution of the problems. These considerations should be included in the statement.

At Page II-20 the draft statement indicates the following: "This [consideration] assumes that the Upper Colorado River Basin States are to supply one-half of the Mexican water treaty obligation or 750,000 acre feet per year." The District adamantly resists such an assumption. The District recognizes no obligation on the part of the upper basin states to supply one-half of the Mexican water treaty obligation.

#### SALINITY

It is the position of the District that the approach adopted by the Bureau of Reclamation in the document Colorado River Water Quality Improvement Program, February 1972 be adopted in the statement. That position is: "The objective

of the program is to maintain salinity concentrations at or below levels presently found in the lower main stream of the Colorado River. In implementing this objective, the salinity problem will be treated as a basin-wide problem recognizing that salinity levels may rise until control measures are made effective while the Upper Basin continues to develop its compact apportioned waters".

It is the position of the District that the draft statement devotes too little attention to the possibilities of salt loading and salinity concentration in the Colorado River. The statement does deal at Page III-39 with the increase in the salinity concentration due to consumptive use of 156,000 acre feet of water per year. However, very little if any attention is devoted to the problem of increased salt loading.

Table III-9 on Page III-69 shows a total population increase by 1981 of 46,738 persons. While this is not a large number of people compared to other more humid areas of the country, the effluent from sewage treatment plans for an increase in population of nearly 47,000 people could cause significant increase in salt and other nutrient loads in the streams of semi-arid country such as that found in the Colorado River Basin. In the face of increased pressure to improve the quality of the Colorado River water it

seems anomalous not to include consideration of this problem in the statement.

Further it appears that more intensive investigation of possible leaching of salts from spent shale disposal piles is in order. One document, "Water Pollution Potential of Spent Oil Shale Residues," prepared by the Colorado State University for the Environmental Protection Agency is referenced as footnote 13 Chapter 1, Volume 1 in the draft statement. That document concludes on page 1 that there is a definite potential for high concentrations of sodium, calcium, magnesium and sulfate ions from spent shale residues. It also concludes that sediment contained in water from spent shale residues will be detrimental to high water quality unless adequate protective measures are taken. Another report, "Water Pollution Potential of Snow Fall on Spent Oil Shale Residues," also prepared by Colorado State University, concludes that dissolved solids concentration in snow melt water is significantly increased by contact with oil shale residue. It also concludes that water which precolates through a bed of oil shale residue emerges very high in total dissolved solids. In the face of such data it would seem obvious that more consideration of the problems of salt loading is necessary in the final statement.

Although the 92nd Congress adjourned without passage of HR 17009, "The Colorado River Basin Salinity

control Act of 1972" the fact that such a bill was introduced indicates the concern of the United States Congress with the problems of salinity in the Colorado River Basin. This or similar legislation could affect an oil industry and should be considered in the final statement.

The District therefore recommends that additional consideration should be given to the problems associated with water supply in the Colorado River Basin, including, the problems associated with salinity in the Colorado River Basin.

The District as the principal water policy body in western Colorado feels that it has the valuable knowledge concerning the multiple problems described above to be of significant assistance to the Department of the Interior in evaluating the water supply for an oil shale industry. The District believes the oil shale industry is potentially of great benefit for the people of western Colorado as well as for Colorado as a whole. Such benefit should not be unnecessarily lost or delayed as a result of inadequate consideration of water supply and salinity at this preliminary stage.

Very truly yours,

DELANEY & BALCOMB

By

  
Kenneth Balcomb

KB/md

THE STATE



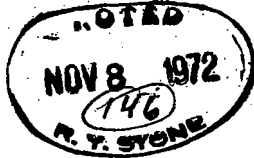
OF WYOMING

STANLEY K. HATHAWAY  
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PHONE 777-7284

J. D. BRUNK  
Executive Director

November 6, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D.C. 20240

Dear Mr. Stone:

This letter is in response to your letter of September 7, 1972, inviting comments on the "Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program."

There is a serious energy shortage in the United States today, the only area of disagreement on that point seems to be the degree of seriousness of the energy shortage.

Volume II, page 23, of the Draft Environmental Statement, states that we are currently 1.5 million barrels per day short of being able to supply our petroleum demands by domestic production and on page 43 it states that the 1985 needs are to be 23.56 million barrels per day with a domestic production potential of 10.11 million barrels per day. This is an estimated difference of 13 million barrels per day by 1985. The proposed Prototype Oil Shale Leasing Program is expected to be producing one million barrels per day by 1985 or 10% of the projected domestic production capabilities in 1985. This one million barrels per day of shale oil added to the 10 million barrels of domestic production still leaves the United States short some 12 million barrels per day in 1985.

These projections make it imperative that we not only go ahead with the Prototype Oil Shale Leasing Program but that we should also work diligently towards similar programs to develop the alternative sources of energy listed throughout the environmental statement.

The Prototype Leasing Program would make less than half of 1% of the total oil shale lands available for leases under the Prototype

Oil Shale Leasing Program. The disturbance of this amount of land (30,720 acres) along with the additional amount of land projected to be disturbed by roads, pipelines, facilities, etc., does not seem to be an unreasonable area when one of the nation's greatest sources of energy is being considered for prototype development.

The prototype program, as explained in considerable detail in the Environmental Statement, certainly will provide industry, government and citizen groups ample opportunity to examine and critique the progress of the prototype development in all three States.

Much time, effort and money have been expended over the years on small oil shale research programs. It is time to move into larger programs to truly evaluate the ability of this country to develop this vast source of energy. In fact, the Prototype Oil Shale Leasing Program affords all of us with a unique opportunity to develop a new and a major industry and still protect our environment.

The Prototype Program itself should be instrumental in developing a viable in situ oil shale retorting program. In situ processing is assumed to be the best process for the two Wyoming tracts but there is not a process yet available for in situ development on a commercial scale. The initial development will probably be by surface mining and surface retorting. This in itself should give the operator or operators a better knowledge of the characteristics of the oil shale deposits and this in itself should accelerate research in the development of an in situ process. The in situ process seems to be the most acceptable process from an environmental standpoint but it also appears to be the least efficient in terms of resource recoverability. This may be an acceptable trade off when the size of the oil shale deposits are taken into consideration. The Prototype Program must encourage the research and development of in situ technology.

In Volume I, Section II, the terms "Green River Basin" and Wyoming Basin" seem to be used interchangeably. The term "Green River Basin" is an accepted name for the geographic region under consideration and the two Wyoming tracts are located in the "Washakie Basin." The term "Wyoming Basin" appears to be confusing and unnecessary.

Also in Section II, page 159, Rock Springs is listed as the county seat. The city of Green River is the county seat of Sweetwater County.

On page 160, the power plant being constructed by Pacific Power and Light Company is described as a 300,000 kilowatt power plant. The design capacity of this facility is three, 500,000 kilowatt units.

Volume II, of the Draft Environmental Statement describes alternative oil shale policies. None of the alternative policies appear to offer the opportunity for evaluating the development of oil shale resources



that exist in the Prototype Oil Shale Leasing Program.

Governmental development of public oil shale lands would only duplicate the efforts of industry on private oil shale lands whereas the proper development should include the joint efforts of all concerned.

No development of public oil shale lands. This does not appear to be a new approach but only a continuation of the policy that has existed for a number of years. This also seems to be true of the alternative policy of delaying development on public lands.

Open leasing doesn't offer any advantage over the Prototype Leasing Program and could result in much more land being disturbed without any additional increase in oil shale production.

The Prototype Oil Shale Leasing Program is the most reasonable approach at this time in that it affords all interested parties an opportunity to take part in the development and to assist in the evaluation of the program before any additional development could take place on public lands. The only question would be if the program as outlined does not restrict participation from the smaller independent oil companies who would like to participate. These smaller companies would probably lose out in the bonus bids and their contribution would be eliminated from this program.

Alternative energy policies and alternative energy sources are also discussed in Volume II. These do not appear to be true alternatives to the development of a one million barrel per day oil shale industry but rather seem to be supplemental sources of energy to be researched, studied and developed in conjunction with the Prototype Oil Shale Program.


It is difficult to envision any single source of energy meeting the demands for energy in the United States. A combination of all the various alternatives discussed will be required if we are to meet the projected demands for energy. Unfortunately, all of these sources of energy have some significant environmental problems associated with their development.

In Volume III, Section I, page 12, the statement is made that, "Provisions could be made to credit extraordinary environmental costs that may develop after the issuance, against the royalties otherwise due the government." This is an area that must be considered because unusual environmental problems will in all probability occur. There should be some sort of emergency fund established from the royalties that could be put to use immediately whenever such an emergency or unusual environmental problem occurs. This fund should be maintained in the State in which oil shale development is taking place under the provisions of the Prototype Oil Shale Leasing Program.

This Prototype Oil Shale Leasing Program should continue as described and these six tracts of land should go to lease and the Prototype Program allowed to take place in order for all concerned to have an opportunity to truly evaluate the effects of oil shale development on the lands, wild life, local communities, state and the national energy shortage.

We offer the assistance of the Wyoming Department of Economic Planning and Development in any aspect of this program where we may be of assistance. Also, as coordinator of the Wyoming Oil Shale Environmental Planning Committee, I am sure that this committee or a similar committee would welcome the opportunity to work with industry and the United States Department of the Interior in the development of the Prototype Oil Shale Leasing Program in Wyoming.

Sincerely yours,

  
John T. Goodier  
Chief of Mineral  
Development

JTG/cc

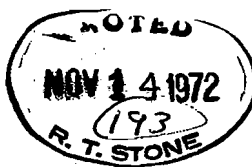
RAYMOND R. RUMMONDS  
CHAIRMAN AND COLORADO  
RIVER COMMISSIONER  
COACHELLA VALLEY COUNTY  
WATER DISTRICT

RAYMOND E. BADGER  
SAN DIEGO COUNTY  
WATER AUTHORITY

JOSEPH JENSEN  
THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

HAROLD F. PELLEGRIN  
EXECUTIVE SECRETARY

LETTER NO. 22



VIRGIL L. JONES  
PALO VERDE IRRIGATION DISTRICT

EDGAR L. KANOUSE  
DEPARTMENT OF WATER AND  
POWER, CITY OF LOS ANGELES

CARL C. BEVINS  
IMPERIAL IRRIGATION DISTRICT

MYRON B. HOLBURN  
CHIEF ENGINEER

STATE OF CALIFORNIA  
**Colorado River Board of California**

302 CALIFORNIA STATE BUILDING  
217 WEST FIRST STREET  
LOS ANGELES, CALIFORNIA 90012

November 10, 1972

Mr. Rogers B. Morton  
Secretary of the Interior  
United States Department of the Interior  
Washington, D. C. 20240

Dear Mr. Morton:

We have reviewed the "Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program" issued by the Department in September, 1972, and have the following comments for your consideration.

General Comments

Because of the report's length and the complexities of the problems associated with the proposed oil shale development, a summary of findings and conclusions would be extremely helpful.

Geothermal energy as an alternative energy source should be given a more thorough presentation. While we agree with the report's statement that it would not provide a viable alternative before 1985, considerable effort is being spent by the Bureau of Reclamation and others in Imperial Valley, California, thereby warranting some further discussion.

Comments Regarding Salinity Impacts

The effect on salinity at Hoover of 2 - 3 mg/l for the proposed 250,000 barrel per day production appears to be in the right order of magnitude, based on the assumptions stated. However, we believe this level of salt increase can be realized only by having a strong program for controlling the dissolved salts which result from mining and processing operations, and preventing them from entering the river system. The report does not state as to when the salinity effect will occur. The report does not adequately describe the assumptions made in estimating the salinity increase that would result from the operations. These comments also apply as to the effect of the 1,000,000 barrel per day operation.

The draft lease agreement presented in the report provided that the disposal of toxic and saline waters shall not pollute surface and ground waters. In this we heartily concur; however, both "toxic" and "saline" should be defined in the agreement. We further urge that any agreement incorporate the same

principle with regard to discharge of waste waters from the mining and processing operations as has been applied at the new thermal electric generating stations in the Colorado River Basin for disposal of blowdown water.

The report describes sodium rich salt beds that occur with the oil shale, yet no mention is made as to how these highly soluble salt beds will be handled; whether they will be mined with the shale, processed, and then disposed of with the spent shale, or if they will be separated and disposed of prior to processing, or whether they will be just left in place. Some discussion of these alternatives and their impact on the river's salinity would be appropriate.

Comments Regarding Water Supply

The report should present specific information on the sources of the water that would be used for the oil shale industry. If the sources include that portion of the water yield of existing and authorized projects that has been allocated for industrial uses, the report should contain specifics on the amounts allocated and on any proposed exchanges.

Thank you for the opportunity of reviewing the draft statement.

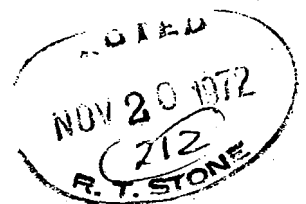
Sincerely yours,

*m. B. Holburt*

MYRON B. HOLBURT  
Chief Engineer

COLORADO  
DIVISION OF WILDLIFE  
COMMENTS ON  
THE  
U. S. DEPARTMENT OF THE INTERIOR  
DRAFT ENVIRONMENTAL STATEMENT  
FOR THE  
PROPOSED PROTOTYPE  
OIL SHALE LEASING PROGRAM

November 1972



STATE OF COLORADO

John A. Love, Governor

DEPARTMENT OF NATURAL RESOURCES

**DIVISION OF WILDLIFE**

Harry R. Woodward, Director

6060 Broadway

Denver, Colorado 80216 • 825-1192

*75th Anniversary—1897-1972*

23



November 2, 1972

Mr. Reid Stone, Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

The Colorado Division of Wildlife has reviewed the Proposed Statement to Develop Oil Shale on two 5,120 acre leases on federal lands in the State of Colorado. The Draft Environmental Statement states that "Oil shale development would produce direct and indirect changes in the environment of the oil shale region....." Some of the changes would be local, some regional and others national. We have submitted general comments concerning the impact of oil shale development on a national regional scale, specific comments on local impacts.

Essentially, the wildlife resources of the Piceance Basin will be adversely affected by any development of oil shale. Consequently, from a purely wildlife viewpoint, we oppose any development. We are concerned with the future of the wildlife resources in the area and have and will continue to do all possible to prevent an irreparable loss; failing this we will assuredly attempt to require mitigation of any loss.

The State of Colorado, four Colorado counties, the federal government and the 12 petroleum companies involved in shale development have entered into a \$715,000 contract to finance a two-year independent study of the prototype shale development program.

Four committees have been created to monitor the studies: 1) Re-vegetation and Surface Rehabilitation; 2) Environmental Inventory and Impact; 3) Water Resource Management; and 4) Regional Development and Land Use Planning. Much of the necessary data will be collected compiled and analyzed by these committees. We feel the information provided by the committees should become an integral part of any proposed oil shale development, thus a review and analysis of the Environmental Statement appears premature at this time.

DEPARTMENT OF NATURAL RESOURCES, T. W. Ten Eyck, Executive Director • WILDLIFE COMMISSION, Dean Suttle, Chairman  
William W. Robinson, Vice Chairman • Ford Strong, Secretary • Dr. J. K. Childress, Member • Wilton W. Cogswell Jr., Member  
Harry Combs, Member • R. Withers Cool, Member • Charles A. Gebauer, Member • Orest Gerbáz, Member • LeRoy Robson, Member

Mr. Reid Stone  
November 2, 1972  
Page Two

We are pleased to note that one of the objectives of the oil shale leasing program is to insure the environmental integrity of the affected area. Since the wildlife resource is such an integral part of the area, we believe every effort should be made to preserve this resource. The statement tends to minimize the effect of an oil shale industry upon the wildlife resource by suggesting revegetation of disturbed areas will insure the restoration of big game populations. We have found human habitation of big game range has a significant effect upon wildlife resources. For example, the Front Range of the Rocky Mountains in Colorado supports an abundant food supply for big game, but their populations are diminishing. This has occurred during the past 20 years as an increasing number of people began living in this area. The Division of Wildlife is quite concerned about the future of the wildlife resource in the Piceance Basin and does not believe the environmental statement reflects a true picture of the impact of a full scale oil shale industry upon wildlife. It does suggest a tradeoff of wildlife resources by replacing big game species with small game.

The statement does not list the species of wildlife present, although it is available, and lists vegetation and soils. The statement discusses the economic benefits derived from an oil shale industry, but does not mention the loss of local revenue as a result of the loss in hunting opportunities.

The statement does not discuss the impacts of water development projects necessary for oil shale development and their effect upon wildlife. These may or may not be more detrimental than mining itself, but the combined effect will be disastrous.

Although the statement discusses the obvious impact of the program upon wildlife, it does not mention the inter-relationship between wildlife and its environment. The disturbance of the present ecosystem will undoubtedly have a significant effect upon wildlife populations in the area. Will ecological studies be conducted? If so, you should mention them.

The Division is also concerned about the power delegated to the Mining Supervisor and the failure to include the state wildlife agencies and the BSWF in the stipulations. One of these tracts is on lands owned by the Colorado Division of Wildlife and decisions by the Mining Supervisor will influence the resource on these lands.

The Division of Wildlife would prefer that no mining be permitted on fed-

Mr. Reid Stone  
November 2, 1972  
Page Three

eral lands. We believe the mining of private lands will answer many questions without destroying wildlife resources on public lands. We urge that you give serious consideration to delay this program until all alternatives are fully evaluated. If it is necessary to mine public lands, we suggest you choose those lands which have the least effect upon wildlife.

Specific Comments on the Draft Environmental Statement on the oil shale leasing program:

Volume I

- I-23 (2) Spent Shale - Doesn't say how the disposal of spent shale will be handled (80-85 percent of original weight and volume 12 percent greater). The water resulting from retorting (2-10 gallons) per ton apparently is no great problem.
- I-25 It mentions the problem of leaching and the high concentration of water soluble calcium, sodium and potassium in the spent shale, but isn't very explicit as to how the problem of leaching will be handled.
- I-38-54 D. Environmental Control - Debatable whether the problem of waste disposal and revegetation has been solved.
- I-64-65 E. Offsite Requirements - Seem to dismiss the possibility of pipeline ruptures and oil spills rather lightly considering the possible volume a maximum of 14,000 bbls. or some 588,000 gallons flow through some pipes.

Neither the Department of Natural Resources nor this Division is listed for comments.

- I-74 Check authenticity of "pellet and dropping counts." We believe this is redundant.
- I-74 Sample fish habitat also.
- II-25 "Sport fishery resources - - - are quite limited". Include white fish.



- II-25 Dismisses wildlife as just being there - we mention economic value of hunting, loss or change in habitat, reduction in number of animals by loss of habitat, construction activity, increase in travel, housing, noise pollution, etc.
- II-25 Provide a list of fish and wildlife in the area.
- II-25 Change last sentence to read 'Several have been classified as rare or endangered.'
- II-28 Paragraph 5 - last line - 'Most of all the fishable waters are outside the oil shale area'. True, but how will demand affect upper White River and other sources - Green Mountain and Ruedi Reservoir and West Divide Project - Table 2 - Page II-21-2.
- II-29 Stream segments should be involved as oil shale demand is the real reason the projects were authorized.
- II-31 The White River is a high quality trout stream from source to Meeker.
- II-39 9 - Recreational Resources - If they are including Colorado, this sentence should be changed.
- II-39 Another popular recreational activity is hunting for Indian artifacts.
- II-60 A significant increase in sage and sharptailed grouse hunting will be detrimental to those species.
- II-60 The difference between hunting and fishing demand and supply will not be as favorable as suggested because supply figures did not consider future losses of fish and wildlife habitat to human encroachment.
- II-71-72 A. Surface Water - Glosses over appropriation of stream flows and possible other sources, but doesn't say what the need will be as related to supply if, and when shale

processing really gets in full production. Water quality is probably a significant problem.

- II-75-76-6. Wildlife and Fish - Again the report lists species and number, but no mention of economic value of hunting, how shale extraction will affect deer, etc. Any plans for protection of habitat, fish?
- II-75 The Colorado Division of Wildlife has established a small herd of bison at their experiment station. In addition, they are conducting research studies on a few Rocky Mountain Bighorn Sheep.
- II-75 Bobcats and coyotes are numerous in Piceance Basin.
- II-85 Change Division of Game, Fish, and Parks to Colorado Wildlife Division.
- II-86 Do you mean Grand Mesa National Forest instead of Uncompahgre?
- II-90 Two potential National Registered Historical sites in Rio Blanco County are listed by the Colorado Historical Society. These are the Thornburgh Battle site and the Meeker Massacre site. Several other sites have state significance.
- III-2 Paragraph 2 - Available water to allow 1 million bbls. per day up to possible 305 million bbls. daily.
- III-12 A. Surface mining land impacts - Lists probable losses by amount of mining and disposal methods. It appears damage to deer habitat is inevitable. It is just a matter of how much and actual loss of acres. Apparently revegetation experiments have been primarily with grasses instead of browse. We question the success of revegetation of processed oil shale.
- III-20 Urban Land Requirements - Doesn't say where develop-

ment, housing, etc., will occur that will consume some 15-20,000 acres by 1985 and eventually double, or more, this amount or about 50,000 acres in 30 years.

- III-55 Development of water projects for the oil shale industry would result in additional losses of wildlife habitat.
- III-58 g. Herbicides and Pesticides - We oppose this planned use.
- III-59 a. Urbanization - covers efficiently possible effects of increased population, access roads, etc., will have on game and fish and pressures on both.
- III-59 Discuss poaching of wildlife under Section a. Urbanization.
- IV-2 Why was the Square S. property deleted from the list of exclusions? This portion of the Piceance Creek Management area is very important to mule deer and sage grouse
- IV-8 Impoundments downstream of disposal areas must be impervious to prevent leaking into subsurface water.
- IV-13 Would studies include effects upon existing aquatic habitat?
- IV-16 Include other mitigating measures such as restricted access, habitat improvements, and land use planning - noise abatement.
- VII-1 A. Consumption - Water use - 116,000-164,000 AF per year for 1,000,000 bbls. per day.
- VII-5 C. Commitment of water - This section lists 80,000-125,000 AF yearly use for 1,000,000 bbls. daily - apparent discrepancy.

Generally a quite comprehensive coverage of all aspects and possible solutions although it is still basically a feasibility report that stresses need for oil, number of new jobs, tax dollars, etc. No mention is made of possible wiser and less wasteful uses of fuels or any alternatives such as mass transportation or any other conservation resources.

VII-5      Loss of wildlife on roads is irretrievable.

Volume II

A wordy dissertation of many possible alternatives with few if any, concrete suggestions to the energy or oil problem for the future. It assumes use and demand will continue unabated. It is really a justification for the need for oil shale in several thousand well-chosen words. There is no mention of oil shale in Colorado, so fish and wildlife are not involved either in this report.

This volume discusses the entire energy picture - the needs and demand. Yet Volumes I & III don't adequately discuss the entire supply from a major industry.

Natural gas also short-would it be better to mine gas from Piceance than oil shale?

P. 42      Compare Alaska increase with oil shale.

P. 53      Why Rocky Mountain - describe other areas.

P. 63-64 Weak argument for "no deer" on federal lands.

Volume III

II-9      Change to Colorado Division of Wildlife.

II-30      e. Fish and Wildlife - Brief summary of species present and use., i. e., winter range and migration.

II-31      Tract C-a does not lie at the edge of a wildlife area managed by the Division of Wildlife. The tract includes this area. We understood that Wildlife management areas would be excluded from development.

II-49      e. Fish and Wildlife - A repeat of Pg. 30, but does attempt to minimize the importance of wildlife in the area. The first part of the report through Pg. III-53 is primarily descriptive material continued to the 6-5, 210 acres - geology and minerals, soil and revegetation types, aesthetics, recreation, socio-economic status, water supply, etc., and possible mining methods except for the

Mr. Reid Stone  
 November 2, 1972  
 Page Eight

above listed fish and wildlife reports some effects listed in Volume 1.

- II-53 Add rabbit brush
- IV 1-13 Deals with actual land and habitat lost or disturbed by mining and disposal, but so many possibilities and alternatives are listed that it is impossible to equate the actual damage but any land without vegetation will not support any deer.
- IV-11 Your statement about Tract C-b indicates there is a possibility that revegetation of processed shale dumps may not be required. Is this true?
- IV 34-40 D. Impact on fish and wildlife - Quite comprehensive coverage. It would appear the entire acreage of both tracts would be lost as habitat plus more for access roads, air strip, pipelines, et. Page 38, paragraph 3, last line - seldom trout below Piceance Creek. Add catfish, sucker - rare and endangered - BSFW says they are.
- IV-38 Ryan Creek is not downstream from C. However, aquatic habitat at Stake Springs, 84 Springs, Yellow Creek and the trout pond on the Violet Place on Yellow Creek might possibly be affected.
- IV-58 Rio Blanco and Garfield counties receive considerable income from deer hunters. The section on economics does not discuss loss of income from this source attributed to the development of oil shale.
- V-56 The section on a Fish and Wildlife Management Plan does not include the BSFW nor the state wildlife agencies, just the Mining Supervisor and the Lessee. Is this intentional or an oversight?
- V-79-82 Note additions of new sub-sections to the stipulations.
- VI-5-9 Fish and Wildlife - Really just repeats previous statements made in Volume 1. Deals with the limited project area or the two plots in each state. Mentions the White River only in terms of increased TDS and salinity.

Mr. Reid Stone  
November 2, 1972  
Page Nine

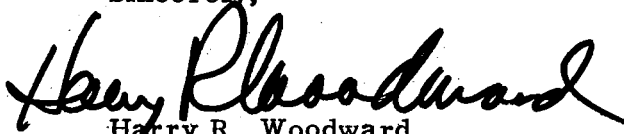
Does not in any volume specifically state how increased production may affect the White flow. We don't know how the possible need for a maximum of 164,000 AF yearly fits into the estimated yield for the White River by Yellowjacket project yield projections, or if minimum flows could be sustained as indicated in the Yellowjacket proposal. Probably the main weakness is they disregard or touch only lightly on the probable project induced effects outside of the project area, such as the White River, draw-down of Ruedi Reservoir, etc. Like most, it is more of a feasibility report or a report stressing the need than an environmental statement, rather vague and evasive, or at least deals in generalities, to the extent that we can't really object to much as it does give quite complete coverage, but is so wordy as to be ineffective.

VI-8      Add the loss of wildlife by poaching.

The task of preparing environmental statements of the magnitude of the Proposed Prototype Oil Shale Leasing Program is a staggering and unrewarding one. The description of regions and selected tracts is reasonably comprehensive, as are the sections describing geology, minerals, physiography, climate, etc. The more nebulous aspects such as water resources, fish and wildlife, aesthetics and recreation are inadequately discussed.

We are hopeful our comments on the statement will be helpful in preparing the final environmental statement and, more importantly, in conserving and enhancing the resources of the Nation for which we are all responsible.

Sincerely,

  
Harry R. Woodward  
Director

DGS/IHW/cb  
cc: T. W. Ten Eyck  
Dale Andrus  
George T. O'Malley  
Hal Boecker  
Colorado Open Space Council  
Trout Unlimited

COLORADO SEMINARY

UNIVERSITY OF DENVER  
DENVER RESEARCH INSTITUTE  
UNIVERSITY PARK • DENVER, COLORADO 80210

Industrial Economics Division

October 19, 1972

Oil Shale Coordinator  
U.S. Department of the Interior  
Room 7000, Interior Building  
Washington, D.C. 20240

Dear Sir:

In response to your invitation to submit statements related to the Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program, I wish to submit the attached paper which has just been presented to the Society of Petroleum Engineers. The SPE reserves the exclusive publication rights for all of its meeting papers but has granted permission for me to submit the paper to you so long as proper identification of the SPE appears on the paper.

The paper you will note verifies the level of oil shale public revenues estimated by the Interior study group. However, it also indicates that a wide range of possibility exists dependent upon the assumed or actual profitability of an oil shale operation.

Other studies conducted at the Denver Research Institute in recent years concerning the rate of development of an oil shale industry also indicate that the development profile presented by Interior falls within the acceptable range of judgment based on national energy needs and the level of our technologic capability. Here again, one should note that this is only one of several profiles that would be acceptable. Judgments as to the number of unknowns could modify this profile both in the amount of capacity that will be developed as well as the timing of development.

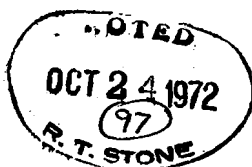
In essence, only actual prototype plant development will answer these market, technologic, and profitability questions. Additional "paper" studies will do little to add to our knowledge or to minimize the remaining uncertainties with respect to these aspects of oil shale development.

Sincerely,

*John J. Schanz, Jr.*  
John J. Schanz, Jr.

Senior Research Economist  
Professor of Natural Resources

JJS:bd  
Enclosure



RELATIVE TAX GENERATION OF SHALE OIL PLANTS  
VERSUS FOREIGN CRUDE IMPORTATION

John J. Schanz, Jr., Thomas P. Brightwell, Charles H. Prien  
University of Denver

One of the attractions of development of domestic resources is the public revenues that are generated from the bonuses, royalties, and taxes that result from the activity. While many are aware that government revenues are involved, only those directly involved make an effort to estimate their magnitude. For the producer taxes are a matter of considerable concern because of the impact on his costs and after-tax income. For the government official it is both a new source of income as well as an activity that will create demands against public funds.

The objective of this paper is to estimate the magnitude of public revenues that are involved in one year's operation of a 100,000 barrel a day shale oil plant in Colorado. These revenues are then contrasted with those that result from the importation of an equivalent amount of crude oil from a foreign source. Finally, the various economic advantages and disadvantages that are involved for the producer, governmental units, and the U.S. consumer are reviewed.

To estimate public revenues to be derived from a national resource that will be produced in the future using an untested technology involves a considerable amount of speculative judgment or estimation. Even the most fundamental data--such as product prices and costs--are not available.

In view of the uncertainty and the judgmental character of the oil shale data, three examples will be presented: (1) governmental revenues assuming that the firm achieves a certain return on invested capital; (2) revenues

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SPE PAPER 4130 for presentation at the Fall Meeting of the Society of Petroleum Engineers of AIME, San Antonio, Texas, October 11, 1972.



based on the National Petroleum Council estimates which specify a shale oil value, estimated cost, and a discounted cash flow rate of return; and (3) revenues reported by the Department of the Interior in their draft environmental statement.

Public revenues from domestic production of oil and gas originate from four sources: (1) payments to government by the company itself; (2) tax payments first by temporary construction workers and then by permanent operating people at the production facility; (3) taxes paid by the company's stockholders who receive a dividend income; and (4) tax payments by other workers who provide support services to the company and its employees.

In Example 1, we assume that an oil shale plant producing 100,000 barrels a day requires an investment of \$578 million dollars and will make a 11.5 percent after-tax return on the initial capital investment. The 11.5 percent return is chosen as a relatively optimistic profit outlook reflecting major oil company experience in recent years as reported by the Chase Manhattan Bank. This places oil shale ventures in a fully "commercial" position generating incomes comparable to that of other oil company investments. Moreover, this direct approach through a return-on-investment assumption minimizes the need to make cost and price estimates and avoids more complex methods of evaluation.

Using this return, the royalty schedule currently stipulated by the Department of Interior, the National Petroleum Council's estimate of percentage depletion, and the present ad valorem tax rates in Colorado, the payments by the company are estimated to be \$63,707,000 per year. See Table 1. The Colorado equipment and land tax and proceeds taxes would vary

through the life of the plant, but the decline in the former is about equivalent to the increase in the latter.

Assuming that there would be between 1800 and 1900 permanent company operating employees, their payments to government in the form of income, property, and sales taxes are estimated at \$2,019,000 per year. Using a 0.8 multiplier, other workers in the community who are indirectly dependent upon the plant would number approximately 1450 and would make payments to government of \$1,615,000. Finally, assuming that the parent company disperses half of its after-tax oil shale earnings as dividends, which again reflects major company practice as reported by the Chase Manhattan Bank, the stockholders would pay \$6,647,000 income tax on their dividends. In this case, an average tax rate of 20 percent paid on gross income by a "typical" stockholder is used as the basis for estimation.

The total payments to government per year from these four sources would amount to \$73,988,000. Not included in this amount are the company and individual payments for social security and unemployment compensation which would involve perhaps \$2.5 million per year. They have not been included because of their special purpose. Also, there are certain non-reoccurring revenues or taxes that would not be received throughout the plant's operating life. Temporary employment of construction workers would yield income and sales tax contributions in the pre-operating period. Also, during this time there would be sales and excise tax payments on material and equipment purchases of several millions of dollars. These payments would be partially offset when deducted as tax allowances. And, finally there is the lease bonus payments. There has been no bidding as yet under the current program, so there is no actual experience upon which to base an estimate. However,

payments for conventional oil leases would suggest that one cent plus per barrel is the proper order of magnitude. The current cost of acquiring leases on private land for \$300 to \$2000 per acre seems to verify this approximation. A five to ten million dollar bonus payment for a lease if prorated over a lease life of twenty years would not cause a significant change in the income and tax calculations used in preparing Table 1.

An inspection of these various payments to government reveals rather quickly that the income tax payments by the company and the stockholders are key items. While most of the other governmental incomes reflect primarily the size of the operation and are not too dependent upon profitability, these two items are the ones most directly affected by the assumptions made as to how successful the plant is in generating earnings.

To display this contrast, the payments to government based upon the work of the National Petroleum Council are presented in Example 2, Table 2. These calculations are based upon an assumed shale oil plus by-product value of \$4.65, an average annual income over a 20 year period based upon a 13.2 percent discounted cash flow rate of return, and a shale oil quality of 35 gallons per ton compared to 30 gallons per ton used in Example 1. There is a significant reduction in government revenues in Example 2. The average annual payments by the company would be \$45,634,000, about 70 percent of the company payments in Example 1. Most of this variation occurs in the income tax payments because of the different assumption used for the rate of return. Concurrently, using the same approach as in Example 1, income tax payments from dividends paid to stockholders drop to approximately \$4,528,000. Payments by the permanent employees and by the supporting population would

not vary to any significant degree. The total revenues would be \$53,796,000 compared to \$73,988,000 in Example 1.

The Interior Department in its current draft environmental statement on prototype oil shale leases has presented information as to their anticipation of public revenues. Their data are for several plants of different sizes, using different forms of mining, and at varying levels of technologic development over a period of six years. Further, although making textual mention of an investment of \$500 million per plant per 100,000 barrels per day of capacity, a shale oil value of \$3.90 per barrel, and discounted cash flow rates of return from 10 to 13 percent, the exact assumptions used in making the tax calculations are not described. Example 3, Table 3, presents Interior's results on a payments per 100,000 barrels per day basis. The Interior total of \$77 million per year for an equivalent amount of shale oil output falls just above the total in Example 1. However, the Interior study includes revenues from a construction force that is approximately equal in size to that employed in the plants.

In this period of concern over the capability of our traditional domestic sources to deliver hydrocarbons, we are not only taking a closer look at domestic alternatives but are also beginning to recognize that foreign crude oil may be the only response we have to the short-term need for energy. This paper obviously cannot attempt to examine the many complexities of policies concerning oil imports. However, it does seem appropriate to examine one case study that will illustrate the government revenues derived from imports.

In the case of foreign crude oil production, the established U.S. practice of recognizing the payments to foreign governments by companies

and employees comes into play. Employees are eligible for foreign tax credits under the U.S. Internal Revenue Code and typically have no U.S. income tax obligation. The companies also receive credit for their payments to the producing countries which usually leaves no net corporate income tax obligation to the United States on the incomes derived from producing the oil. Finally, if the shipment of the oil to the United States is by a foreign flag shipping corporation, the most common situation, there is no income tax payment for the shipping firm.

Crude oil imported from Nigeria was chosen for the case example presented in Table 4 since the calculations could be based upon data available from published government studies. It is recognized that the choice of the country of origin and what kind of company is shipping the crude will have a marked effect on the size of revenues and to whom they are paid. Agreements between host governments and the producing companies concerning participation in the earnings and the obligations of the companies to re-invest earnings in the country can vary. Obviously, the costs of oil production and the costs of shipping to the United States East coast will not be uniform. While recognizing these limitations, the Nigerian case does appear to be a representative one and perhaps understates rather than overstates the potential payments in the U.S. The current value of import tickets suggests somewhat higher U.S. profits from imports than shown in the Nigerian case. Also, if the Nigerian crude would be valued at the same level as the shale oil instead of at current prices on the East Coast, the government revenues would be increased.

In Example 4, we find that payments by U.S. companies operating in Nigeria can amount to \$67,745,000 per year to that government. However, the

credits allowed for these payments under the U.S. Internal Revenue Code will not eliminate all U.S. revenues. The U.S. import duty of \$0.105 per barrel and port fees and dues will involve payments in the U.S. of over \$4 million per year. Based upon the value of South Louisiana crude on the East Coast the crude when delivered to the U.S. will have a value of \$4.107 per barrel when sold or as an intra-company transfer. This extra value will ultimately lead to a tax revenue for the U.S. Assuming that the crude cost \$3.605 to deliver in the United States, the \$0.502 per barrel difference generates U.S. taxable income and could lead to an estimated \$8,797,000 dollars in company federal income taxes. Although the company as a result of its tax credits does not have to pay a U.S. income tax on the estimated profit of \$0.722 per barrel in Nigeria, in the example we assume that these profits will flow back to the parent company in the United States. The after-tax profit on these combined earnings amounts to \$0.983 per barrel. Again assuming as we did in the Shale Oil Example 1 that half of the earnings are paid out in dividends to stockholders who have an effective tax rate of 20 percent, the stockholders would pay \$3,588,000 in income taxes.

The total payments to governments by our Nigerian producer amount to over \$84 million dollars per year for 100,000 barrel per day of crude shipped to the United States. This total is of the same order of magnitude as the amounts estimated to be paid to government in the first three shale oil examples. Of this total, only around twenty percent, or \$16,656,000 is possible revenue for the United States. It should be noted that this example points out that although our system does grant foreign tax credits, the U.S. government does derive revenues from foreign resource production by U.S. companies. However, much of this U.S. income is dependent upon

profit or incomes flowing back to this country and becoming subject to taxation. If a similar quantity of crude oil would be purchased from a foreign producing company, or if the profits would be reinvested abroad, then only the import duties would remain as a U.S. revenue.

The public revenue facet of the choice between using domestic versus foreign hydrocarbons seems to balance out as a plus for reliance on a domestic source. Yet it is only one small compartment of a much larger and complex economic situation. From the consumer's viewpoint the governmental incomes derived from domestic production are not too attractive if they involve paying a higher price for the products delivered to him even though he may benefit as a taxpayer. In effect, through these higher prices, he is subsidizing the production of a domestic resource. Consequently, he will find little merit in high-cost domestic production unless he is a direct and fairly significant benefactor from the tax revenues generated.

For government, taxes are not all gains and no costs. Along with the public participation in the fruits of resource production comes the obligation to provide public services and facilities. From the state and local viewpoint it is absolutely essential that the tax generating potential of local resource production is equivalent or greater than the demands that this activity will place on local government to build schools and roads, to provide police and fire protection, and to fund welfare and the other societal obligations of the successful community. Royalties, lease bonuses, and personal income and property taxes cannot do this alone. Public revenues are heavily dependent upon the corporate and stockholders earnings which flow from an economically viable operation. If the costs of production and the market place prices do not yield adequate earnings to tax then the

community will find its obligations exceeding its ability to finance them. If the community seeks to compensate for this through higher tax rates or other revenues to increase its share of the resource value then the after-tax earnings retained by the company may no longer be adequate compensation for the corporate investment and the operation becomes uneconomic. In essence, whether it involves foreign oil importation, a domestic crude oil operation, or a shale oil plant, the public and private benefits of producing the oil must exceed the public and private costs both collectively and individually.

The national perspectives are somewhat different than those of the local community or the individual consumer. Although the individual community may have some discretion as to whether or not to seek expansion and to exploit local economic opportunities or resources, as a nation we have no choice but to assure ourselves that the exploitation of our national resources and the combined efforts of all of our communities are yielding adequate revenues to support the total population. The productive effort of the nation as a whole must provide the base from which public revenues can be derived to provide essential public facilities and services.

The local consumer quite properly seeks the most economic satisfaction of his needs whether it be of foreign or domestic origin. But the nation must also be concerned about national security when it chooses between foreign oil and domestically produced energy. The question then becomes what is the best solution in arriving at a trade-off between reliable supplies and lowest cost if you cannot have both. To seek total reliance on assured domestic crude oil supplies under present day conditions probably is no



longer worth the added cost per barrel it entails. But this does not deny that an extra cost for some form of emergency protection may be well worth the measure of security it provides.

National security aside, it is fundamentally sound for the U.S. consumer to seek the benefits of lower cost foreign energy. But nationally this importation of energy must be balanced ultimately by an export of materials, manufactures, services, or capital from the United States. A case in point is the earnings that return to the United States from foreign operations of U.S. oil companies. Quite properly the national leadership must view with concern the net future effect on the balance of payments if we purchase large amounts of foreign oil. But the problem is not so much the importation of the oil but the possible inability of the United States to find a means to match the oil imports with various forms of income-earning exports, including the earnings flowing back to the United States from foreign investments by U.S. petroleum companies. If we cannot in the long-term match imports of crude oil and products and other foreign goods with investment earnings and U.S. exports salable in international trade, there remains only one alternative--consume less as a nation. This must occur because we will not have the means to purchase low-cost imports while domestic products will only be obtainable at higher cost. Controls that lead to a forced reliance on more costly domestic sources of energy do provide national security protection for the fuel industries and avoid aggravating our balance of payments but in no way do they avoid our paying the cost of that security and that protection. Under these circumstances at some point in the national economic system we will produce and consume less than we would have otherwise.

In summary, estimating the public revenues that will be derived from the production of a domestic resource, whether it is crude oil, shale oil, or some other primary resource, demonstrates the rather impressive magnitude of these sources of additional funds for federal, state, and local government. Yet, in our public and private planning for resource development we cannot escape the basic reality that only those resources that are truly economic can provide a reliable source of income for both the investor and the public at large.

Reliance on foreign sources of oil does generate public revenues at the federal level. These revenues under our present statutes are less than are derived from domestic production of an equivalent amount of energy resources. Importation also has a particularly severe impact on incomes available to state and local governments. Further, the future revenues from foreign oil activities may be determined politically rather than on a purely market-place basis. However, the broad question of relying on domestic rather than foreign resources cannot be answered solely on the basis that we wish to obtain a greater generation of public revenues through the production of domestic resources. This is a problem that can only be considered within the framework of the total U.S. posture in international trade and our overall productivity.

Production of shale oil offers an opportunity for providing sizable revenues at all levels of government. However, these potential returns are heavily dependent upon the actual profitability that oil shale operations can achieve. Until shale oil plants are actually built and operated we will not know with certainty whether they will generate incomes for the public

good or become an energy source that can only survive if protected and subsidized by the rest of the economy.

The authors wish to acknowledge the suggestions and information provided by the following individuals: Russell J. Cameron, Cameron Engineers; James S. Cross, Sun Oil Company; Helmut J. Frank, University of Arizona; John Hutchins, Atlantic Richfield Company; A. J. Rogers, Atlantic Richfield Company; and John J. Ross, Gulf Oil Corporation. Naturally, the analysis and conclusions are the authors' own and not the responsibility of the gentlemen listed above.

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Reference: Sparling, R.C., Zrally, A. J., and Anderson, N. J. with Winger, J. G.; Annual Financial Analysis of a Group of Petroleum Companies 1971, The Chase Manhattan Bank, August 1972, 33 pages.

TABLE 1

SHALE OIL EXAMPLE ONE

Public Revenues Derived from a Colorado Oil Shale Operation

A "Commercial" Return on Capital Invested

Payments by Company

Royalties (Federal 62.5%, State 37.5%)	\$6,360,000
Federal and State Income Tax (Combined rate 50%)	48,840,000
State Ad Valorem Taxes	
Equipment and land tax	6,129,000
Gross/net proceeds tax	2,378,000
Severance Tax (Oil shale exempt in Colorado)	None
Lease bonus, FICA/FUTA Payments, and sales taxes	Not Estimated
	<u>\$63,707,000</u>

Payments by Operating Employees

Federal Income Tax	\$1,186,000
Colorado Income Tax	234,000
Colorado Sales Tax	359,000
Personal Property Tax	240,000
FICA Payments and local sales taxes	Not Estimated
	<u>\$2,019,000</u>

Payments by Corporate Shareholders

Federal Income Tax	\$6,647,000
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Payments by Support Population

Income, Sales, and Property Taxes	<u>\$1,615,000</u>
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Total Public Revenues for One Year	<u><u>\$73,988,000</u></u>
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Assumptions and Basic Data:

Plant produces 100,000 barrels per calendar day of shippable synthetic crude from 53,000,000 tons per year of 30 gallons per ton shale. Work force is between 1800 and 1900 men and production is from an underground mine with an adit entrance. Work force is classified into three salary classes. The plant is a subsidiary or division of a major U.S. oil company. Capital investment is \$578,000,000 on a property leased from the Federal government. The company income tax calculations are based on the assumption that this is a fully commercial operation yielding an 11.5% after-tax return on the initial capital investment. Based upon the NPC base case, a percentage depletion allowance of \$17,630,000 is used in calculating the company Federal Income Tax. Half of the after tax earnings are paid out to stockholders as dividends. The stockholders as a group average 20 percent income tax on their gross income. A multiplier of 0.8 is used to estimate the payments from the support population based upon the permanent employment.

TABLE 2

## OIL SHALE EXAMPLE TWO

Public Revenues Derived from a Colorado Oil Shale OperationNational Petroleum Council Base Case Data\*Payments by the Company - Annual Average over Twenty Year Period

Royalties (Federal 62.5%, State 37.5%)	\$7,446,000
Federal and State Income Taxes (Combined rate 50%)	28,769,000
State Ad Valorem Taxes	9,419,000
Severance Tax	None
Lease bonus and FICA/FUTA Payments	Not Estimated
	<u>\$45,634,000</u>

Payments by Employees

\$2,019,000

Payments by Corporate Shareholders

\$4,528,000

Payments by Support Population\$1,615,000Total Public Revenues for One Year\$53,796,000

\*Source: An Initial Appraisal by the Oil Shale Task Group, National Petroleum Council, U.S. Energy Outlook Interim Reports, 1972.

Assumptions and Basic Data:

The NPC data have been modified slightly to be more comparable to the assumptions used in Example One. Plant produces 100,000 barrels per day of shippable synthetic crude using 35 gallon per ton shale. Production is from an underground mine on Federal leased land with an adit entrance. Plant has a twenty year operating life. Taxes are based on a shale oil value of \$4.50 per barrel and by-product value of \$0.15 per barrel and a 13.2% discounted cash flow rate of return. Capital requirements are an investment of \$503,000,000 plus \$21,000,000 for working capital. Employee, stockholder, and support population payments are derived as in Example 1.

TABLE 3

SHALE OIL EXAMPLE THREE

Public Revenue Derived from Oil Shale Operations

U.S. Department of Interior Data\*

Federal Income - Per 100,000 Barrels per Day of Capacity

Royalties (62.5% of total)	\$2,925,000
Federal income taxes from producers, individuals, and other businesses	<u>52,075,000</u>
	\$55,000,000

State Income

Royalties (37.5% of total)	1,750,000
State Income and Sales Taxes for producers and other businesses	<u>4,750,000</u>
State personal income taxes	<u>2,000,000</u>
	\$8,500,000

Local Income

Producer property taxes	10,750,000
Other private property taxes	<u>2,750,000</u>
	\$13,500,000

Total Public Revenues per 100,000 B/D of Output	<u>\$77,000,000</u>
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\*Source: Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, Volume I, U.S. Department of the Interior, September 1972.

Assumptions and Basic Data:

Based upon a 400,000 barrels per day industry in 1981, with five plants in Colorado and two plants in Utah and Wyoming. Plants will have begun operation at various times from 1976 to 1981, will be both underground and surface mines, and will have capacities of either 50,000 or 100,000 barrels per day. Operations will be on both private and federal lands. State and local tax payments based on current rates in Colorado. Construction employees are included in the work force.

TABLE 4

## THE IMPORT CASE

Payments to Governments Derived from Foreign Crude Oil ProductionPayments by Company in Nigeria

Royalties	\$12,593,000
Taxes	53,947,000
Terminal and Custom Duties	1,205,000
Nigerian Revenues	<u>\$67,745,000</u>

Payments by Company in the United States

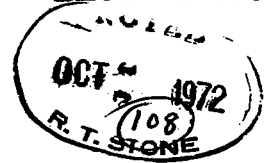
Import Duties	\$3,833,000
Income Tax on U.S. Profits (48%)	8,797,000
Port fees and dues	438,000
	<u>\$13,068,000</u>

Payments by Corporate Stockholders

U.S. Income tax	<u>\$3,588,000</u>
United States Revenues	<u>\$16,656,000</u>
Total Payments to Governments	\$84,401,000

Assumptions and Basic Data:

100,000 barrels per day of 34° crude is imported to the U.S. East Coast from Nigeria. The company is U.S. owned and received foreign tax credits in calculating its income tax. The crude oil is shipped by foreign flag vessels. All company employees qualify for foreign tax credit. No significant purchases of U.S. origin equipment, supplies, or services are made. The company will make a \$0.722 per barrel profit on its Nigerian operations. The cost of the crude delivered in the U.S. will be \$3.605 per barrel and has a U.S. value of \$4.107 per barrel creating a potential U.S. profit of \$0.502 per barrel. The after-tax profit from the combined Nigerian and U.S. profits is \$0.983 per barrel. Half of this is paid as dividends and the stockholders pay an average income tax of 20% on their gross income.



WYOMING GAME AND FISH DEPARTMENT  
REVIEW OF THE DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED  
PROTOTYPE OIL SHALE LEASING PROGRAM

In the interest of contributing to the process of effective public decision making relative to the proposed Prototype Oil Shale Leasing Program within the State of Wyoming. The Wyoming Game and Fish Department offers the following comments upon review of The Draft Environmental Statement for the proposed program, dated September 1972.

For a more clear understanding of the statement here offered, a brief explanation is perhaps in order.

In the official capacity of the Game and Fish Department, we are charged with administering the mandates and policies of the people of the State of Wyoming with respect to wildlife as stated by law and prescribed by the Game and Fish Commission.

In Section 23-2 Wyoming Game and Fish Laws revised February 1, 1972, it is declared that all Wildlife in Wyoming as defined in Section 2 hereof (23-1) is hereby declared to be the property of the State of Wyoming; and it is the purpose of this act and the policy of the State of Wyoming to provide an adequate and flexible system for control, propagation, management, protection and regulation of all such wildlife.

In Section (23-1) Wildlife is defined as follows: "The words W I L D L I F E shall be construed as meaning all wild animals, birds and fishes within the State of Wyoming."

In Section (23-16) it is stated "The Commission shall authorize and collect classify and disseminate such statistics, data and information as in its discretion will tend to promote the objects and purposes of this act. The Commission may make such allowances from the Wyoming Game and Fish fund and may utilize state agencies insofar as it may be expedient to carry out the processions of this section."

In line with the purpose of The Environmental Impact Statement, and the purpose and policy of the Wyoming Game and Fish Department as stated above it is not intended that this statement shall be in support of or in opposition to the proposed Prototype Oil shale Leasing Program or the subsequent development thereof.

It is the purpose of this statement to disseminate such information as will within the discretion of the Commission promote the objects and purpose of providing for the continuing system for control, propagation management protection and regulations of wildlife within the public decision making process.

We as professional Wildlife Managers are charged to contribute to providing a factual accounting of the impact of the various alternatives of the proposed project, and the public are to make the decisions as to the selection of alternatives through your selected delegations.

In fulfilling our charge, we submit that the following information will aide in rendering the Draft Environmental Statement for the proposed Prototype Oil Shale Leasing Program more complete, more accurate and more factual.



Page I-52

It is stated that reestablishment of the fuller range of Native Brouse and Cover species may be difficult and time consuming.

It is hoped that this difficulty will not be a deterrent to continued efforts in this direction. A commitment would seem to be in order at this point stating that the time element in developing the W-a & W-b leases is such that reestablishment of Native Brouse and Cover species can be accomplished and will be required.

Page I-74-75

States that Colorado has requested interests on Federal State and local level to outline a broad course of additional studies for four important areas of environmental concern committing 3/4 million dollars and two years. Perhaps the findings could be applied to the Wyoming proposal, or perhaps the State of Wyoming should enter into a similar program through the existing Environmental Planning Committee.

Page II-23

Suggest that "or use by Wildlife and Domestic Live-Stock, or for domestic purposes," be added at the end of the 2nd paragraph. The probable drying up of existing fresh water springs in the area as a result of lowering the water table will have a definite impact on wildlife, rendering existing habitat unavailable to many species. Since this is indicated as an unavoidable impact, it is suggested that consideration be given to mitigation in the form of providing surface water for wildlife as a project cost.

Page II-29

It is stated that lists of streams which support high-quality trout streams in the area omit those stream segments that are subject to damage from the construction of authorized projects. This would seem to be an appropriate place to tabulate and account for the cumulative impact of impending development since this is the major area of concern to the current users of the area including the management of the fisheries and wildlife.

Page II-40

Add (f) "utilization and enjoyment of open space" to list of recreational resources. This would be effected to a great degree by the proposed development.

Page II-152

There is a need for input from Wyoming Game and Fish on Small Game.

Page II-159

Suggest reference to "Rock Springs" as county seat of Sweetwater County be corrected.

Page III-21

The cumulative impact including that of related development needs to be accounted for in order for the public to make a rational decision for or against commitment.

Page III-29-60

B. Hunting and Angling Pressure.

This section should be rewritten, structured by individual states. Pertinent facts include:

1. Jurisdiction and management of wildlife including hunting regulations is by individual states.
2. The same reference quoted shows the demand for Wyoming in the year 2000, to be 178,000 man days as opposed to habitat capacity of 172,000 man days, leaving a deficiency of 6,000 man days.
3. Current and considered management practices along with relative hunter success must also enter into any evaluation of comparisons and determinations of impacts. Number #2 above would in itself render the subsequent reasoning in this section inaccurate.

Page III-83

Table III-16 showing impact of increased population and crime rates indicates a need for added Enforcement of Game and Fish Law and increase in personnel to accomplish this requirement. To determine the cost of this increase relative to added income to the department would necessitate a determination of the percentage of population increase who establish resident in Wyoming. Under present management programs, the increase in pressure on Big Game would be only from resident hunters. This would not provide the proportionate revenue to the department unless resident fees are further increased or success is further curtailed by management practices or legislation.

Volume III of III Page II-78-79

E. Wildlife

Wildlife population densities as well as current and potential use should be accounted for in the section. Rare and endangered species should be accounted for separately. "No angling habitat exists on the tract" "angling" should be changed to "fisheries."

Page II-82

Under (h) Aesthetics. Open space should be given a positive value with the resulting impact of the proposed project being accounted for.

Page V-1

More detailed commitment to mitigation for unavoidable adverse impact should be accounted for on individual tracts. See Department comment on Page II-23 for an example of possible mitigation.

Page IV-45

A table should be included to show impact of W-a & W-b on wildlife.

Page V-56 Section 4A

Provision should be made for approval of legally responsible agency ie., Wyoming Game and Fish Commission in Wyoming.

Page V-57 (C)

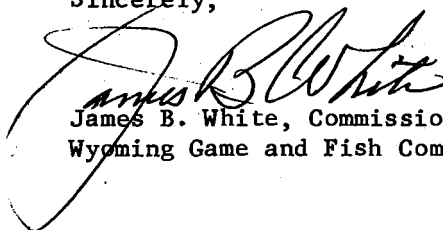
This section should be rewritten to provide for all wildlife.

Page V-48 (A)

Add part (J) to Section (1) General stipulations to provide for mitigation of unavoidable adverse impacts.

Thank you for the opportunity to comment on The Draft Statement.

Sincerely,

A handwritten signature in dark ink, appearing to read "James B. White". The signature is fluid and cursive, with a large initial "J" and "W".

James B. White, Commissioner  
Wyoming Game and Fish Commission

HBM/JEW/cmc

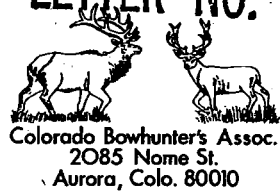
cc; Game Division  
Fish Division  
Research & Development Division  
U.S.B.S.F.&W.

November 4, 1972

LETTER NO. 26

OFFICE OF

NOV 9 1972



Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Virginia 22203

HEARINGS & APPEALS

Subject: Comments on the Draft on the Environmental Impact  
Statement on Oil Shale Development

Dear Sirs:

The Colorado Bowhunters Association requests that our statement be made a part of the official record and a part of the final Environmental Impact Statement on oil shale development.

The Colorado Bowhunters Association opposes the presently proposed oil shale development in Colorado for the following reasons:

(1) In volume 3, section 2, page 31 reference is made to 16 miles of new roads into the two proposed 5120 acre tracts CA and CB. This is a very unique semi-wilderness area, part of which presently has a winter deer population of 50 deer per square mile. The roads will not only bring in workers and trucks but additional people and cars not even associated with the development. All this activity is incompatible with a continued large deer population.

(2) In volume 3, section 4, pages 34 thru 41 refers to the fact that tract CA directly bisects the migratory route of this deer herd. This access from Cathedral Bluffs in the high country to the Picaance basin wintering range is vital to the survival of this herd. Development of this area will critically affect the herds existence.

(3) Volume 1, section 1, page 52 tells of revegetation and reforestation of the area. Of the 6 grasses previously experimented with 4 are not native to this area. The Mountain Mahogany, Shadbush and Bitterbrush that comprise the major browse for the deer have never been successfully replanted in large quantities. If the reforestation is again unsuccessful the deer will be deprived of their natural winter browse.

(4) The shale tailings are to be deposited in 2 to 6 canyons 8 miles to the west of the development site. "Four Mile Draw", "State Bridge Draw" and "Philadelphia Creek" are among the canyons that may be filled. These are the homes of an unknown number of bobcats, coyotes, eagles and rabbits as well as deer. These canyons are outside the two proposed 5120 acre tracts and therefore the destruction will cover more than just the development areas.



Mr. James M. Day (continued)

Page 2 of 2



(5) Volume 3, section 4, pages 34 thru 41 tells of the disruption of the local water that is vital to the winter survival of the deer herd. At least 2 springs will be totally dried up.

(6) The Governors Oil Shale Advisory Studies on wildlife inventory, replanting & reforestation, water, and land use plan will not be complete until 1974. No decision on use of this land should be made until that time.

Summary: Implementation of the oil shale developement in this unique ecological area will: (1) destroy the semi-wilderness aspects of this area, (2) bisect the natural migratory route of the Piceance-White River mule deer herd between their summer & winter ranges, (3) ruin the winter browse of the deer, (4) fill canyons that are the habitat of untold numbers of animals and (5) ruin the natural water supply.

This area is very important to the sportsmen and especially to the bowhunters of Colorado in that 15% of the hunting recreation and deer harvest in the state take place in this area. Oil shale developement will seriously endanger the survival of the states largest deer herd and therefore ruin hunting recreation and deer harvest.

The Colorado Bowhunters Association strongly urges abandonment of this plan and points out that this environmental impact statement draft is totally inadequate in the review of the impact on deer harvest and hunter recreation in this area.

Respectfully submitted

*Gerald L. Egbert.*

Gerald L. Egbert  
Board of Directors  
Colorado Bowhunters Assoc., Inc.

11/6/72

LETTER NO. 27

Dear Sirs,

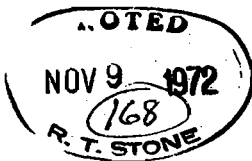
This letter is to formally request  
that this statement be made part of  
the official hearing record.

Thank-you

Raymond Mohr

Environmental Planning Comm.

Colo. Environmental Health Assoc.



OFFICE OF

NOV 8 1972

HEARINGS & APPEALS

Gentlemen:

My name is Raymond Möhr. I have come to this hearing to speak on behalf of the Colorado Environmental Health Association. I do not speak for my employer, the City and County of Denver, Department of Health and Hospitals

It is my understanding that testimony taken at this hearing should be directed to the preliminary environmental impact study as provided. However, because of the exclusion of certain areas of concern to my organization, reference to the study will necessarily be oblique.

My testimony will cover anticipated impact on: health services, medical and dental services and facilities, availability of personell in the health fields, water quality and supply for municipalities, sewage disposal systems (both individual and municipal) and other closely associated environmental health matters that will occur when this area containing only 1.7% of the states population becomes a small urban center in a very short period of time.

According to figures and statistics obtained from Colorado Comp. Health Planning Council the entire northwestern area of the state is woefully lacking a satisfactory health care system. There is no organized regional or county health department, for intents of and purposes no hospital or emergency care system, and only a small number of doctors, dentists, and other health professionals. Hence, if no effective health system exists one must be developed. This raises some important questions. How will almost a complete health care system be funded? Who will pay the cost of developing and maintaining such a system? How soon would a health system be able to be in

operation? In my opinion the impact statement discusses none of these problems. As a matter of fact, figures from the state comp. Health planning office show decreases in the populations of Moffat and Rio Blanco counties through 1980. This indicates, possibly, the impact study was prepared without consulting state planning agencies.

The impact statement makes no mention of how municipal water and municipal sewage effluent will be able to be maintained in compliance with state and federal standards. Since over half of the population is currently on a municipal system of some sort planning and funding will have to be done to ensure adequate, safe water as well as complete and efficient municipal sewage systems in the target area.

In closing let me say that I have not gone into detail at this time but a more detailed critique of the impact statement will be forthcoming by the October 23 deadline. I do want to reiterate the intent of the Environmental Policy Act as I, as a health environmentalist interpret it. That is, to ensure that actions of man will not endanger the quality and health of the environment in any way.



A Critique of the Draft Environmental Statement  
for the  
Proposed Prototype Oil Shale Leasing Program

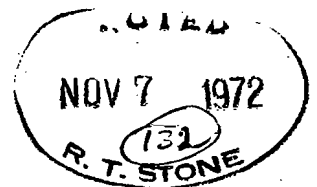
prepared by

Gary E. Parish

for

Colorado Environmental Legal Services

November 3, 1972





# Telegram

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FON

DIRECTOR OFC OF HEARINGS AND APPEALS

DEPT OF THE INTERIOR

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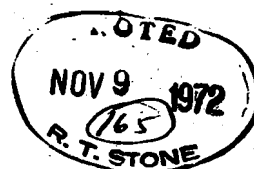
REQUEST INCLUSION OF STATEMENT SUBMITTED FOR COLORADO  
ENVIRONMENTAL LEGAL SERVICES DATED NOVEMBER 3 72 IN OFFICIAL  
HEARINGS FOR DRAFT ENVIRONMENTAL STATEMENT ON PROPOSED OIL SHALE  
PROTOTYPE LEASING PROGRAM

GARY PARISH

OFFICE OF

NOV 6 1972

HEARINGS & APPEALS



A Critique of the Draft Environmental Statement  
for the  
Proposed Prototype Oil Shale Leasing Program

The problem for the citizen reviewer of the statement is the same as that apparently faced by the Department of the Interior in its preparation: lack of adequate scientific facts and experimental data upon which to build an ordered systematic review of developmental impacts. In place of adequate information the Department Draft has felt compelled, in view of a perceived "energy crisis", to proceed on assumptions, estimates, and conclusions drawn therefrom. The criticisms I level against this draft statement, if substantiated, would place the 'adequacy' of the statement in serious question according to judicial interpretation of NEPA (National Environmental Policy Act), Section 102 (2) (c) impact statements. It was determined in National Helium Corp. v. Morton (10th Cir. 1971) that one of the purposes of the impact statement is to provide the decision-maker with "complete awareness" of the environmental consequences of his action. In Environmental Defense Fund v. Corps of Engineers, 325 F. Supp 749, Judge Eisele stated:

At the very least, NEPA is an environmental full disclosure law...intended to make....decision-making more responsive and responsible. The detailed statement required by Sec 102(2) (c) should at a minimum, contain such information as will alert the President, the Council on Environmental Quality, the public, and indeed, the Congress to all known possible environmental consequences of proposed agency action.

This concept of a full disclosure requirement has been followed in such cases as Calvert Cliffs, 449 F. 2d 1109 (D.C. Cir., 1971), Committee for Nuclear Responsibility v. Seaborg, (D.C. Cir., 1971); Environmental Defense Fund v. TVA, (E.D., Tenn., 1972), Natural Resources Defense Council v. Morton, (D.C. Cir., 1972); and Natural Resources Defense Council v. Grant, (E.D.N.C., 1972). Before publication of the final impact statement, the Department must, of course, determine that such a statement will meet the tests of "complete awareness" by the decision-maker, and full disclosure to the public. The insufficiency of the draft statement under these tests will be developed with respect to its treatment of supplying water for the proposed projects.

I

The history of natural resource development in western lands revolves around one very important issue: the adequacy of and rights to use of the limited water supplies in that area available for development. My initial reading of the draft impressed me with its ability to discuss in great length a wide number of problems without ever coming to grips with the heart of the issue for the area involved: the water problem. When the analysis in the statement conjures an image of a distinct possibility that the overall development of the Colorado shale lands could lead to a production of surplus waters to be released into

the surface waters (I-III-43 and I-Table III-6 for an underground operation), the credibility of the statement and the mode of its analysis in arriving at such results are naturally called into question.

Table III-4, Vol. I sets forth an estimated water demand (consumption) for a 50,000 bbl/day oil shale plant under certain listed assumptions. The components of this consumption are mining, crushing, retorting, processed shale disposal, shale oil upgrading, and personnel, construction, etc. The estimated water demands at the lease site will be between 587,520 and 915,840 ft<sup>3</sup>/day. Water supply is supposedly obtainable from retorts, oil shale upgrading, and from mine dewatering (I-Table III-6). Of the total estimated water supply per year from these processes, the water to be obtained from dewatering will constitute approximately 95% of the total obtainable in either an underground or surface mine. The importance of this source of water to supply needs is therefore paramount. Yet, in the statement's own words, "the [source] least subject to quantification with available data, is the water that may be produced during mining operations", (I-III-25). Can the clue to the alleged abundance of water in the arid west be hidden in such a sentence?

In view of the admission that 95% of the assumed water supply at the lease site is the least amenable to measurement, one questions the subsequent emphasis in the draft upon the Trial Water Balance (I-III-35). Certainly the figures on the bottom line of that table should have relatively little significance since the entire supply side of the equation is admittedly suspect. The final impact statement must operate on the full disclosure principle, i.e., if the figure possibly or probably over-estimates the available supply of water, the statement must indicate the range of possible alternatives and their impacts. At a minimum the statement must comply with the complete awareness test and explicitly disclose the problems in the trial water balance technique as presented and possible ramifications of errors. The policy of NEPA is certainly not being met by the draft presentation which must be altered to present a more responsible indication of the possibilities of error in the techniques used in analysis and impacts arising from those possibilities.

The statement's treatment of water supply is deficient in another respect. There is no consideration given to the water demands which are associated with the concurrent population growth in the area--both population growth directly responsible from mining and construction activities and secondary and tertiary service sector growth. NEPA impact statements must consider these associated impacts resulting from the action taken, both under the full disclosure principle and the complete awareness doctrine. Societal water demands are given cursory treatment in the statement. My complaint is that by failing to indicate the problem in the "demand-supply" section (I-III), both the public and the decision-maker are misled as to the actual inter-relatedness of the problem. The prevailing impression that this section leaves with the reviewer is that water supply will equal or very nearly equal water demand. I request that as a minimum requirement

the final draft statement enter a clarifying statement that the trial water balance does not consider secondary or tertiary effects. Footnote 3 to Table III-6, Vol. I is the only indication that the problem has been considered. This footnote does not enable a citizen to understand the scope of the consideration given (secondary and tertiary growth?, drinking fountains and toilets at the plant site?, increases in domestic and service sector water consumption in Rangely, Meeker, Grand Junction and new cities?, etc.) The complete awareness is lacking.

There is a further conceptual difficulty with the estimated water supply analysis. The water to be obtained from the mine site will draw down the ground water table, induce a 'cone of depression' into which highly saline water will flow during the later periods of extraction, and will, in the statement's words, cause a change in the ground flow characteristics in the flow basin and dry up some springs in the area. (I-III-39-41). Figure III-5, Vol. I illustrates the hypothetical supply of water to be obtained from a typical underground mine. The supply from dewatering a single mine is then incorporated into the results in Table III-6 to develop the trial water balance for two hypothetical mine developments with the resulting impression of supply sufficiency described above. Just how realistic is the use of figures from Figure III-5 in the trial water balance analysis? An indication of the validity can be obtained by examining the contents of III-II-28-30.

After sufficient overburden is removed to begin mining oil shale, additional water that will be required to mine, retort, and refine shale at the rate necessary to produce 100,000 bbl/day of shale oil, could be obtained from wells penetrating the leached zone. Fortunately, pumping water for consumption will lower the water level initially at a rate faster than the rate of increased depth of excavation... After a few years, the rate of withdrawal may need to be increased and water pumped to waste in order to maintain a dry pit, if the transmissivity and storage coefficients are about the same or larger than have been estimated or, conversely, if aquifer characteristics are smaller than estimated, then yields may decline so that adequate ground water for consumptive use would not be available without drilling additional wells further from the pit and conveying the water to the site by pipeline.

The quotation leads to several observations:

1. Evidently "wells penetrating the leached zone" are envisioned. If such wells are sunk and withdraw water, what will be the effects on the ground water levels? It will depend on a number of factors: distance from the mine site, horizontal and vertical transmissivities at both the mine site and the well sites, the number of wells, and the problem of "spacing" in well activities.
2. Assuming that wells have been sunk within the area to provide water for the prototype system and that sufficient water can be obtained in this manner for the prototype operations, an impediment for any future development of the shale lands (given success of the proto-

type system) may arise since these wells will be drawing upon water resources in the leached zone. Well water withdrawals from the leached zone will necessarily affect the availability of water for any desired further development. What will be the effects in terms of water availability for expansion to a 1 million bbl/day operation? If we were only discussing the feasibility of the prototype plan involving two mines each in Colorado, Utah, and Wyoming, the well withdrawals would be relatively unimportant. Since the statement is ultimately considering a mature 1 million bbl/day industry, we must know the effects of water withdrawals from the leached zone at early stages of development on the availability of water from the zone during possible expansion to mature industry size. The trial water balance technique and hypothetical water supplies from a single mine (without nearby wells) (Figure III-5, Vol. I) are inadequate and misleading.

3. Another instructive statement contained in the last quotation is: "...the rate of withdrawal may need to be increased and water pumped to waste in order to maintain a dry pit..." In Table III-6, Vol. I under the heading of 'surface mine' (the statement quoted refers to a surface excavation in tract C-a), the trial water balance derives figures for excess high quality and excess low quality water. One could make the facile assumption that the water to be pumped to waste from the pit would be the same water as that indicated in the excess high quality category of the balance sheet. Such an assumption is not warranted for two reasons. First, note that the water pumped to waste situation would occur "after a few years". This does not tell one much, but we do know that the "larger withdrawals of ground water probably will be (sooner or later) salty [or low quality], (I-II-19), "chemical quality of pumped water probably will deteriorate at some unknown rate as water is induced into the cone of depression..." (III-II-30). Second, the trial water balance technique correctly divides the water supply into high and low qualities. Such a distinction is to be commended in view of the difference in demands and requirements for the two qualities. The problem is that the analysis misses an even more important factor: the times at which high and low qualities of water are demanded and supplied. In order to even closely approximate the "balance" presented in the trial balance technique, the demands and requirements by the plant operation for each quality of water must roughly equal, at any given time, the quality and quantity of the water being produced by dewatering and well withdrawals. Only if such a composite balance between the supply and demand of the two water qualities and quantities are obtained at each step of development will the balancing technique in Table III-6, Vol. I be an adequate representation of the overall problems of water demands and supplies. What indication is there that such a fortuitous phenomenon will occur?

Fortunately, pumping water for consumption will lower the water level initially at a rate faster than the rate of increased depth of excavation. Depending on the real value of transmissivity, the storage coefficient, the effects of hydraulic boundaries, and on the consumptive use that will be determined by final plant efficiency, the amount of water available from wells and the altitude of the

saturated zone can be either favorable or unfavorable to mining operations. (Tract C-a, III-II-29, my emphasis).

Because of the need to lower the water level below the underground mine workings, more ground water would be pumped initially than would be consumed in spent shale disposal, retorting and other operations attendant to the production of 50,000 bbl/day of shale oil. Maintaining a water level beneath the mine workings would result in water pumped to waste during the early years of mining but the yield would decrease to less than consumptive use before the mine was worked out. The dissolved solids content would cause the water to be usable to marginal for some purposes initially, but the pumped water would deteriorate with time as water having a higher dissolved solids content moved into the cone of depression. The quality of water would be suitable for many of the larger consumptive uses such as spent shale disposal. (Tract C-b, II-II-47).

In the event that water pumped from the mine is usable, the mine dewatering process may supply all the water needed... On the other hand, if the ground water withdrawn could not be used, the operation would be faced with the dual problem of disposal of waste water and importing a water supply. (Tract C-a, III-IV-16-17).

Water pumped from the upper part of the leached zone might be used in plant operation, but water from the lower part of the leached zone may be extremely saline and could present a disposal problem. (Tract C-b, III-IV-21).

These statements indicate that the problem of demand-supply equality at any given time that I have posed have not been solved or adequately investigated in the draft statement. The inadequacies of the trial water balance analysis are compounded by the total lack of any analysis of the time-factor in water supply and demand. Assuming that the figures in the trial water balance analysis are even a close approximation of the total supply and demand for water, they do not relate the supplied water to the water demanded at any given time or phase of project development. That is, the available water at any given time is not necessarily the quality, or quantity for that quality, of water needed at that time of plant operation.

Thus far I have pointed out some misleading and inaccurate "micro" analysis techniques employed in the draft's discussion of the problem of finding available water supplies for the development of the oil shale lands. The most serious criticism is that the use of these figures and techniques are extremely misleading in that the impression they convey is that adequate water is available for plant site requirements. I have attempted to show that the reality of the situation is that very little is actually known about such supplies and even less is known about the quality of the water obtainable. The final statement

would do more justice to scrap the trial water balance technique because of its misleading characteristics and to employ in its place a model that shows, for any given time, the industry water demands in terms of quantity and quality as compared to the water supply at that time, including the supply sources, quantity, and quality. Any imbalances shown by such a model can then be analyzed for disposal of excesses and supply sources for shortages. The draft analysis of the regional impacts on water resources also have a number of shortcomings. In the last half of this critique attention will be paid to "macro" analysis of regional water supplies and demands.

## II

The draft statement recognizes that some water for the development of the shale lands will have to come from the surface waters of the upper Colorado River drainage system. Once again the impression left in the mind of the reader of the draft is that there will be no problem in acquiring those waters. A quick glance through the history of US Congressional debates, Western Law and Mining Journals, and western legislative histories makes it abundantly clear that water supplies have occupied a position of paramount importance in the history of the western lands. Can it be possible that a major new industry can now be developed in that area, appropriate vast amounts of water and avoid the problems that have plagued so many in the past? Perhaps we have an analogous situation to that discussed in the initial parts of this paper in which the draft statement, because of the particular method in which it approaches a problem, has diverted attention away from the paramount issues.

There are numerous passing references to the "fact" that water, if actually needed, could be obtained from pipeline diversions from the Colorado River or its tributaries. (I-II-22,72,110,149,III-31,36, VII-5; III-II-30,47,62,78, IV-17, VII-5). A factor of importance is that during the drier portions of the year the entire streamflows of these rivers and their reservoirs are appropriated or even over-appropriated under state apportionment regulations. Since an industrial activity such as that planned will require a constant water supply during the entire year, or at least an assured water supply as all times, some method will have to be conceived which will make available a part of the waters that normally escape during the spring run-offs, while not impairing the Colorado River Compact obligations with sister Upper Basin States, Lower Basin Compact States, and the requirements of the treaty with Mexico. "In order to insure dependable supplies of water from the Colorado River or its tributaries, dams and reservoirs must be constructed, or water must be purchased from existing reservoirs." (I-V-3). For a document of such extensive length as this draft, one could expect to find: 1) the environmental impact of these actions; 2) any adverse environmental effects which cannot be avoided should either situation be undertaken; 3) alternatives to either or both; 4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term



productivity, and 5) any irreversible and irretrievable commitments of resources which would be involved in the proposed actions should they be implemented. What is offered in this respect?

The water diverted for all uses would have an unavoidable impact on regional water supplies, because any storage, diversion and net consumption of existing water resources would deplete natural streamflow. This in turn would increase the salinity concentration of the Colorado River at Hoover Dam from 6 to 10 mg/l; a maximum of 1.4% for the full 1 million barrel per day industry. (I-V-3 and III-VI-3).

If there is more complete treatment of impacts I was unable to locate it. The final statement needs to remedy this omission in a specific area of the text. Several problems which must be adequately explored in the final statement will be discussed below.

The obviously more simple solution to the availability of a dependable water supply would be the purchase of water from existing reservoirs. "Some water from the Colorado River could be obtained from the existing Green Mountain and Ruedi Reservoirs..." (III-IV-17). We can only speculate how much water is obtainable from Ruedi Reservoir and note that a pipeline to the lease site would have impacts not discussed. Robert Delaney, an expert on western water law and oil shale development indicates (43 Denver Law Journal 76) that "the Green Mountain Reservoir will not be of substantial assistance in supplying stored water for shale oil development" largely because it has been allocated already. The final statement must clearly indicate if water is to be obtained from either or both of these sources and if all of the water needed can be so obtained. It appears that insufficient stabilized water supply is obtainable from existing reservoirs.

Alternatives to existing reservoir supplies are presented in the draft in a number of locations. "A future possible source of water would be the authorized West Divide Reclamation Project" (III-IV-17). Is this a realistic supply source? The West Divide Project would provide the containment of 77.5 thousand AF (acre-feet)/year. When the Bureau of the Budget released its study on the proposed project (April 30, 1966) it was disclosed that the project would have one of the highest costs per acre (\$1,710) and investment per farm cost (\$273,000) of any reclamation project ever authorized. The Bureau recommended withholding authorization of the project. Since these costs must be fully disclosed to the public, the final statement must attempt to balance it with the benefits to be gained as compared to alternative uses. An added problem in obtaining water from this or any other reservoir not yet constructed or under construction is the diversion of vast amounts of water from reclamations (with legislative histories steeped in the purpose of supplying water for agricultural uses) to that of industrial uses. Litigation over such allocation could be a very real impediment to securing a reliable source. If over appropriation of waters has occurred under operation of state laws in the water district in which a reservoir is constructed, the holders of those appropriative rights would have prior rights to the

water impounded over those of the oil shale industry. In addition, under Colorado law municipal and agricultural users have a higher preference of allocation than industrial users.

"In the White River it may be possible to obtain water from the proposed Yellow Jacket Project, Rio Blanco Reservoir or Sweetbriar Reservoir if they were constructed by the time water is required." (III-IV-17) In view of the "if" and "may be possible" qualifications, what kind of assured supply source do these alternatives offer? Each of these unconstructed, proposed or authorized reservoirs will certainly be the subject of serious public examination and controversy similar to that surrounding the development of any resource belonging to the public in general. Each project will require the issuance, after detailed study, of environmental impact statements and final determination by the Secretary of the Interior. Each will be subject to possible litigation. Such barriers are not conclusive, yet they must be considered (in order to meet the full disclosure requirement for public decision-makers) as part of the possible cost-structure of the project under consideration in this environmental impact statement. Certain reclamation projects are currently being criticized (especially the Yellow Jacket Project) because of the high elevation of the proposed dam site and adverse environmental impacts in comparison to alternative lower elevation projects. An additional problem that has arisen since the draft was issued to the new Flattops Wilderness area created by Congress during the last session. Impacts upon this wilderness area from reclamation projects in the vicinity will have to be considered. Since the draft statement must cover adverse environmental impacts from the proposed action and since water may be acquired from reservoirs if they are constructed, this impact statement must give some attention to the impacts of the authorized reclamation projects should they be undertaken. That the proposal for oil shale leasing and for reclamation are separate and distinct is not sufficient grounds for non-consideration of the reclamation impacts in at least a general sense. The purpose of NEPA is to obtain comprehensive and coordinated planning. If the water which is absolutely required for oil shale development must come from these reclamation projects, then there are costs involved in that use which must be considered by the Secretary of the Interior in order for him to adequately weigh costs and benefits. Additionally, these associated impacts must be part of the official record.

Another suggested water source is acquisition of senior appropriative rights by purchase. It is given minimal attention in the draft because it is unknown how much water could be obtained and at what cost (certainly equal to or greater than the cost of water obtainable at a reservoir-plus a transportation differential). Delaney (43 DLJ78) discusses some of the potential legal problems of acquiring a supply of water from such private sources, and concludes that the legal problems could prove insurmountable. For instance, an irrigation right, regardless of the priority date does not give the appropriator or his assignee the right to divert water for industrial use or to store the water for later use. (Colorado Revised Statutes S148-9-13(3)(1963)). An oil shale developer-assignee would stand in the same rights as the

prior appropriator, and would have junior rights if the type of use was changed from irrigation. Additionally, winter run-off flows must be separately adjudicated and would have a junior appropriator status in relation to settled rights in the water district in the event of a low run-off. There is evidence of over-appropriation during low-level flows, so appropriators of run-off may have a legal problem in establishing rights under the Colorado appropriations system.

An assessment by the Bureau of Reclamation of the amount of water presently available for potential development after accounting for present use and presently committed future uses is given in Table 2 (I-II-21). These figures are then combined with that estimated to be obtainable from water augmentation pursuant to Public Law 90-537 to give Colorado a total of 547,000 AF/year of water that could be used for developing the oil shale industry. Let us examine these figures with a little more care than is employed in the draft. The augmentation is to be accomplished by weather modification, desalting, or "other measures." (I-II-22). The impacts from any or all of the augmentation projects are not even mentioned in the draft. The weather modification alternative would appear to offer considerable impacts. I am unable to determine how desalting will in any way augment the total quantity of water available unless the desalting were to occur on waters from the Great Salt Lake--fanciful to say the least. "Other measures" will of course have "other impacts". The final statement needs improvement. The existence of the 388,000 AF/year needs to be substantiated or shown to be probable. The impacts associated with augmentation must be disclosed since they would constitute a part of the environmental cost structure. Even if such a quantity of augmentation to the drainage system could be accomplished, there is little assurance that it will be accomplished prior to the time an oil shale industry will have needs for it. An authorized leasing program may "bootstrap" the demand for augmentation projects which have serious environmental impacts by altering the water-demand-benefit portion in balancing of costs and benefits which must be done for any project approval. In such a circumstance, the environmental costs associated with the augmentation programs should be weighed as costs of oil shale development. Of the remaining 159,000 AF/year said to be available before augmentation (Table 2, I-II-21), 147,000 AF/year is to come from the existing Green Mountain and Ruedi Reservoirs and the authorized West Divide Project (Table 2, footnote 2). As I have already indicated, the supply from these sources is non-existent, unassured, or involves highly controversial benefits and impacts. None can be considered secured sources at this time--and secured sources are the sine qua non of development.

"The Bureau of Reclamation estimated that up to 5.8 million AF/year are available for Upper Basin depletion (i.e., consumption)." (I-II-20). Since Colorado is allowed to retain 40% of the waters of the Colorado River Basin flowing into the Lower Basin States under the provisions of the Colorado River Compacts, there must be an annual average flow of 14.5 million AF/year to provide the 5.8 million AF/year suggested by the Bureau of Reclamation. The following table, obtained

from Pub. L. 90-537, U.S. Code Cong. & Ad. News 3684, indicates that the average and the 10-year running average of virgin flow at Lee Ferry (water before any withdrawals for consumptive purpose) have been dropping and have not been near 14.5 million AF/year since the early 1950's. I was unable to obtain flow records since 1967 at the Denver Federal Center. The data summarized in this table illustrate the main reason for passage of the Colorado River Basin Project Act (Pub. L. 90-537). Congress recognized that the treaty obligations to Mexico of Colorado River water were based on an overestimate of the actual availability of water from that drainage system--the same overestimate as that upon which the Bureau of Reclamation based its figure of 5.8 million AF/year available for consumption in Colorado. The act was designed in part to make water available by "augmentation" projects chosen by the Secretary of the Interior after careful study in order to meet the needs of presently over-appropriated supplies. There is therefore good reason to doubt the actual availability of up to 5.8 million AF/year for consumption in Colorado, since that figure is based on an average virgin flow which has been recognized by Congress as a "mistake in fact". The final draft needs to revise its use of these figures to conform to legislative fact finding.

TABLE I.—ESTIMATED VIRGIN FLOWS AT LEE FERRY<sup>1</sup>

(In millions of acre-feet)

Water year ending Sept. 30	Estimated virgin flow	Average including 1967	10-year running average	Water year ending Sept. 30	Estimated virgin flow	Average including 1967	10-year running average
1896	10.1	14.8		1932	17.2	13.1	15.9
1897	18.0	14.9		1933	11.4	13.0	15.2
1898	13.8	14.8		1934	5.6	13.0	14.3
1899	15.9	14.9		1935	11.5	13.3	14.2
1900	13.2	14.8		1936	13.8	13.3	14.0
1901	13.6	14.9		1937	13.7	13.3	13.5
1902	9.4	14.9		1938	17.5	13.3	13.5
1903	14.8	15.0		1939	11.1	13.1	12.5
1904	15.6	15.0		1940	8.6	13.2	11.8
1905	16.0	15.0	14.0	1941	18.1	13.4	12.8
1906	19.1	14.9	14.9	1942	19.1	13.2	13.0
1907	23.4	14.9	15.5	1943	13.1	13.0	13.2
1908	12.9	14.7	15.4	1944	15.2	13.0	14.2
1909	23.3	14.8	16.1	1945	13.4	12.9	14.4
1910	14.2	14.6	16.2	1946	10.4	12.9	14.0
1911	16.0	14.6	16.5	1947	15.5	13.0	14.2
1912	20.5	14.6	17.6	1948	15.6	12.8	14.0
1913	14.5	14.5	17.6	1949	16.4	12.7	14.5
1914	21.2	14.5	18.1	1950	12.9	12.5	15.0
1915	14.0	14.4	17.9	1951	11.6	12.5	14.3
1916	19.2	14.4	17.9	1952	20.7	12.5	14.5
1917	24.0	14.3	18.0	1953	10.6	12.0	14.2
1918	15.3	14.1	18.2	1954	7.7	12.1	13.5
1919	12.5	14.1	17.1	1955	9.2	12.4	13.1
1920	22.0	14.1	17.9	1956	10.7	12.7	13.1
1921	23.0	13.9	18.6	1957	20.1	12.9	13.5
1922	18.3	13.7	18.4	1958	16.5	12.1	13.6
1923	18.3	13.6	18.8	1959	8.6	12.0	12.9
1924	14.2	13.5	18.1	1960	11.3	11.7	12.7
1925	13.0	13.5	18.0	1961	8.5	12.1	12.4
1926	15.9	13.5	17.6	1962	17.3	12.7	12.1
1927	18.6	13.5	17.1	1963	8.5	11.8	11.8
1928	17.3	13.3	17.3	1964	10.2	12.7	12.1
1929	21.4	13.2	18.2	1965	18.7	13.5	13.0
1930	14.9	13.0	17.5	1966	10.8	10.9	13.1
1931	7.8	13.0	16.0	1967	11.0	11.0	12.1

<sup>1</sup> Col. 2 shows the estimated virgin runoff at Lee Ferry for the year indicated in col. 1. Col. 3 shows the average virgin runoff from the year indicated in col. 1 through 1967. Col. 4 shows the progressive 10-year running average virgin flow through the year indicated in col. 1.

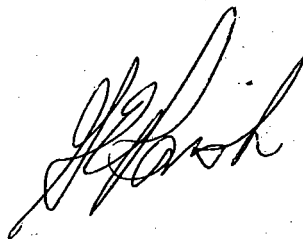
The final deficiency in the draft involving water problems is the effect on water quality of the Colorado River. The draft informs us that the "water diverted for all uses would have an unavoidable impact on regional water supplies...increasing the salinity concentration of the Colorado River at Hoover Dam from 6 to 10 mg/l; a maximum of 1.4% for the full 1 million bbl/day industry". (I-V-3). The final statement needs to give further examination to the effects on the salinity ratio that will result not simply from withdrawals of relatively purer waters for use by the oil shale industry and its population centers, but also to the effects of waters returned to the Colorado River after such uses. Delaney (43DLJ73) gives a figure of 165,000 AF/year for the quantity of water that will be returned to the Colorado River by a 2 million bbl/day operation. The figure was derived in 1953 and may not be relevant or accurate now, yet it contains more information to work with than the draft on the subject of water returns. If the water returned to the river after being used has a higher salinity content than was present at the time of withdrawal, the increase in salinity at Hoover Dam will be far above 1.4%. In the absence of desalting operations by the plants and municipalities, it is likely that the salinity ratio of the returned waters will be higher than it was prior to use. The impacts of any increase in salinity must be discussed in the final statement. Any increase in salinity will affect all subsequent agricultural uses. The potential of an international confrontation with Mexico requires careful consideration of the salinity impact from all uses of water and not just from the initial withdrawals mentioned in the draft. To simply state that salinity at Hoover Dam may increase 1.4% is not an adequate discussion of impacts. Who will be affected by the 1.4% increase and to what degree, are the real questions left unanswered.

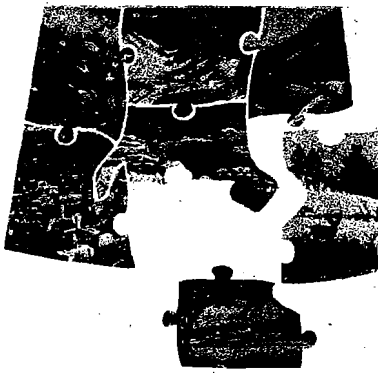
This critique has been confined solely to a discussion of the draft statement's treatment of water problems concerning the proposed Colorado development. Problems and deficiencies have been noted in both the technique of analysis, and the data used. There are further problems of unwarranted assumptions and misleading statements. The aggregate effect has been the creation of the misleading impression that: 1) there is adequate water for the prototype development and 2) the impacts involved in the use of water in oil shale development are minimal. In order for the final statement to meet NEPA's requirements of complete awareness by the decision-maker and full information disclosure to the public, the deficiencies must be remedied. It would be helpful if the water problems involved (supply, demand, and impacts) were treated in a single section with adequate documentation so that review and understanding were facilitated for both the public and the decision-makers. The importance of the "energy crisis" is certainly equaled by the "water supply crisis" of the western lands.

A prototype leasing system is almost predicated upon an implicit understanding that the granting of the prototype leases will be the end of the controversy over development of the full-scale 1 million bbl/day industry or even a larger industry. To assert, as the draft does, that any further development beyond that of the prototype system will be carefully and adequately considered by the Secretary of

the Interior misses an essential consideration of political realities and administrative practices. One is hard pressed to imagine the oil industry volunteering to invest substantial funds in a pilot program without a certain future. There is also a very real problem of bureaucratic insistence on continuation of programs and funding already initiated and of "empire building". We would like to imagine a world where the Secretary could make a totally fresh analysis at the end of the initial lease term based on totally accurate information supplied to him by his subordinates and the industries involved, yet we must be prepared for repetitions of past experience. It is incumbent that the final statement address itself to the problems and impacts of a full scale industrial development. An attempt to divorce the problems and impacts of the prototype proposal from an analysis of the problems and impacts of a full-scale successor would circumvent the very purpose of NEPA--full planning and cost accounting of all direct and indirect impacts.

This draft impact statement has been shown to have serious inadequacies concerning the availability of water and impacts of water use because of the data used, the methods of analysis (especially the trial water balance at mine site), and conclusions drawn from these sources. It is hoped that the final statement will correct these problems and at the same time satisfy NEPA's principles of complete awareness by the decision-maker and full disclosure of potential costs to the public. In view of the facts that the proposed industry by 1985 will supply at most 4% of the nation's energy, the environmental consequences involved, the vast number of unknown impacts, as well as the presently unsolved problem of supplying the industry and its communities with waters already in short supply in the region, something more than the alleged (and attacked) concept of an impending energy crisis will have to be found as a basis for approval of this proposal at this time.

A handwritten signature in dark ink, appearing to be "J. B. Smith", is located in the lower right quadrant of the page. The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.



# COSC

*Colorado Open Space Council, Inc.*

5850 E. JEWELL, DENVER, COCO. 80222 - 7 - AREA CODE 303-758-9991  
1742 Pearl Street, Denver, Colorado 80203 573-9241

November 7, 1972

Mr. James Day  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203



Dear Mr. Day:

We hereby request (in accordance with our telegram of this same date) that this letter and the enclosed opinion of the District Court on the Clean Air Act, May 30, 1972, be entered into the hearing record for the comments on the Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program. This opinion was upheld by the Circuit Court of Appeals on November 2, 1972.

With regard to the prototype oil shale development program, and in accord with this decision, the burden of proof would rest with the Department of Interior to provide adequate information that there would not be "significant degradation" of air quality, as stipulated under the Clean Air Act.

It is our opinion that the draft environmental impact statement does not adequately cover this area. We submit our request that the Department of Interior comply with the Clean Air Act.

Sincerely,

COLORADO OPEN SPACE COUNCIL, INC.

*V. Crane Wright*  
(Mrs.) V. Crane Wright *on*  
President

VCW:mmm  
AIRMAIL/SPECIAL DELIVERY  
Enclosure

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Table 1. ASSESSMENT OF ENVIRONMENTAL IMPACTS

IMPACT	MAGNITUDE	BASIS OF ESTIMATE	UNKNOWN FACTORS INFLUENCING IMPACT	COMMENTS ON COMPLICATIONS
iv-2 Land disturbance	8,000-13,000 acres	Direct proportion with production	Depends on extraction and processing methods	
iv-16 Water consumption, Tract Ca	10-14 million gal/day	100,000 bbl/day open-pit mine	Usability of water pumped from pit	May require disposal of waste water and water importation
iv-17 Use of river water	"large part" of 25-40,000ac. ft. / yr. for 6 sites (p. vii-5)		Availability of river water; construction of reservoirs in time for oil shale development	
iv-17 Pipelines for water			Probability of ice formation	
iv-17 Pumping water from mine	"several tens of cfs"		Effects on water table	
iv-18 Accidental release of saline water				
iv-18 Treatment of saline water			Seismic results	
iv-18 Sedimentation, erosion	"significant"		"adequate controls" (p. iv-22)	
iv-19 Slurry spills				
iv-19 Oil spills	No great danger (p. iv-23)		Probability of tank or pipeline failure, existence of proper safety precautions	
iv-21 Contamination of ground water, in-situ operation			Perfection of in-situ process	
iv-21 Water consumption, tract Cb	5.5 million gal/day	50,000 bbl/day underground mining		
iv-21 Penetration of aquifers, mine pumping	10 + cfs		Salinity of aquifer	
iv-21 Water table	Infringe on water rights			May reduce wildlife habitat
iv-23 Contamination of ground water by back-filling			Inadequate data on leaching	



Table 1--Continued.

IMPACT	MAGNITUDE	BASIS OF ESTIMATE	* UNKNOWN FACTORS INFLUENCING IMPACT	COMMENTS ON COMPLICATIONS
iv-23 Surface subsidence	Not severe	Considerable slope of stream channels		
iv-24 Ground-water contamination, in-situ process			Inadequate knowledge of process	
iv-24 Fracturing of Mahogany Zone			Upward movement of artesian water, increased porosity, changes in water flow, leaching properties of spent shale	
iv-32 Ambient air pollution 57-85 tons SO <sub>2</sub> , 21-29 tons NO <sub>2</sub> , 47 tons dust	"has yet to be established"		Temperature inversions	
iv-33 Noise				Wildlife disturbance and habitat reduction
iv-34 Road work tract Ca	16 miles			
iv-34 Hunting pressure on wildlife	population reductions			
iv-34 Human activities	Chronic disturbance and displacement of wildlife		Net combined effect	
iv-35 Airstrip	Stress on wildlife		Volume of flights and species adaptability	
iv-35 Land disturbance	Food, cover loss, population (deer) declines of 50/section	McKean and Bartmann	Revegetation time and success of revegetation	
iv-36 Utility corridors	175-225 acres directly disturbed			
iv-37 Waterlosses, tract Ca	2 springs destroyed			
iv-37 Erosion	6,650 acres exposed		Inadequate information to estimate impact on wildlife	
iv-37 Disruption of migration routes				
iv-37 Bird losses on power lines	"relatively minor"		"cannot be accurately predicted"	

Table 1. --Continued

IMPACT	MAGNITUDE	BASIS OF ESTIMATE	UNKNOWN FACTORS INFLUENCING IMPACT	COMMENTS ON COMPLICATIONS
iv-38 Dust on roadside vegetation			Time for rain to wash off dust	
iv-38 Oil spill			Volume, season, species exposed	
iv-38 Degraded water quality	"adverse" effects downstream			
iv-38 Increase of human population	30,000 people			
iv-39 Surface disturbance, tract Cb	800-2,200 acres	Method of extraction		
iv-39 Off-tract disturbance	1,200 acres			
iv-46 Loss of grazing, tract Ca	30-50 AUM/yr 1510-6650 acres	Method of extraction		
iv-48 Loss of grazing, tract Cb	30-50 AUM/yr 1630-2210 acres	Method of extraction		
iv-46, Lower weight gains for young cattle				
iv-51 Noise impact on aesthetics				
iv-51 Air pollution impact on aesthetics			Frequency of temperature inversions	
iv-51 Visual impacts	"notable"		Time needed for restoration	Open-pit mine may create new "scenic vista"
iv-53 Camping				
iv-53 Displacement of hunters				
iv-54 Tourism				Increased traffic to new "scenic vista" (p. iv-52)

## Lease and Stipulations

Although the stipulations may be intended to "assure" quality reclamation of the public lands, they lack the mechanisms, information bases for decisions, enforcement, incorporation of expertise and advice, specific standards of achievement--all of which are necessary for good intentions to become realities. In part, this lack can be attributed to ignorance of present ecological and environmental conditions in the oil shale region, and in part to a desire to make the leasing program attractive to potential lessees. But, whatever the causes, the stipulations do not accomplish the objectives of the program as described in the statement: "... in a manner that will assure the minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area" (II-1).

The accompanying fold-out table exemplifies the almost complete failure of the stipulations to "assure" the objectives cited from Volume II. To summarize our criticisms:

--No specific standards of achievement are defined; indefinite, inexcusably vague language is used, such as "to the extent consistent with good mining practice," "to the extent practicable," "when feasible," "only as may be reasonably necessary," "reasonable." It is not clear how "to the extent practicable" will be interpreted in specific situations; how is practicability determined?

--The draft does not discuss the costs of achieving successful reclamation and successful mitigation of environmental damage on oil shale lands. Yet cost is a major factor that directly bears on the quality of reclamation and mitigation measures. Potential lessees will need the estimates before they can make a prudent business decision. The public will need the estimates before it can evaluate any public costs that might result from the lease provision for crediting "extraordinary" environmental costs against royalties paid by the lessee (III-v-10).

--No accurate, detailed picture of the existing environment is presented in volumes I and III of the draft. This critical inadequacy makes the draft's discussion of reclamation and mitigation meaningless--it is not known what exists now, what the impacts will be (Table 1) and how to avoid or lessen damage.

--No provisions for enforcement of the stipulations are presented. The lessee designs and operates the environmental monitoring program to check his own compliance with regulations and to provide notice of conditions which might require correction. After the recent Ford Motor Company case of falsifying test data on automobile pollution controls for the Environmental Protection Agency, we are aghast at the proposal that industry can or will regulate itself.

--No mechanism for incorporating the expertise of personnel from other local, state or federal agencies in decisions is included. The public has no established access to make positive contributions to decisions on reclamation and mitigation.

--No alternative stipulations are presented.

Table 2. ASSESSMENT OF LEASE STIPULATIONS  
(M.S., Mining Supervisor, U.S.G.S.)

PAGE	OBJECTIVE	TIME FRAME	STANDARD OF ACHIEVEMENT	DETERMINATION OF STANDARD	APPROVAL	OTHER AGENCY, PUBLIC INVOLVED
24 v-45-B	Revision or amendment of stipulations	"At any time" during lease	"To adjust to changed conditions or to correct an oversight"		"Mutual consent" of M.S. and lessee	BLM District Manager helps decide on feasibility of revision or amendment
v-45-C	Lessee prepares, as part of exploration and mining plan, an environmental monitoring program		Program designed to provide continuing check on compliance with laws & stipulations, a factual basis amendment & revision, and timely notice of detrimental effects & conditions which require correction		M.S. approves monitoring plan	
v-47-F	Lessee provides environmental briefings for supervisory personnel	Life of lease	"Only. . . as may be reasonably necessary"		M.S.	Other agencies if designated by M.S.
v-48-H	Construction, operation & maintenance of housing & facilities for welfare of employees		"Orderly manner;" shall not "unreasonably damage the environment of the leased lands"		M.S.	
v-48a-A	Lessee shall provide corridor plans for roads, pipelines & utilities		Include "probably" major design features, plans to protect environment & rehabilitate or revegetate disturbed areas, use multiple corridors "to the extent practicable"		M.S.	
v-49-D	Divert runoff from roads and uphill slopes		Waterbars, waterbreaks or culverts	BLM specifications		

Table 2. -- Continued

PAGE	OBJECTIVE	TIME FRAME	STANDARD OF ACHIEVEMENT	DETERMINATION OF STANDARD	APPROVAL	OTHER AGENCY, PUBLIC INVOLVED
v-56-A	Lessee submits Fish & Wildlife Management Plan	Before exploration or mining begin	Plan is to "explain" steps lessee "proposes to take" to avoid, minimize, & restore damage to wildlife habitat, provide alternate habitats, provide controlled access to public for enjoyment of wildlife resources		M.S.	
v-59-A	Lessee conducts investigation for objects of historic or scientific interest	Prior to construction and mining	"Thorough and professional investigation"		None, lessee reports results to M.S.	
v-59-B	Prevent injury or destruction to object of historic or scientific interest	Term of lease		M.S. makes final determination on historic or scientific interest "where a question exists."		
v-61-D	Limits on use of pesticides and herbicides	Life of lease	only Use/when "reasonable" alternatives are not available and where "use is consistent with protection and enhancement of the environment"	M.S. prescribes procedures as to type, amount, method of application, storage, disposal, etc.	M.S.	
v-65-A	Rehabilitation of all affected lands		To usable, productive condition consistent with pre-existing land uses and compatible with existing, adjacent undisturbed natural areas "to the extent practicable"			

Table 2. --Continued

PAGE	OBJECTIVE	TIME FRAME	STANDARD OF ACHIEVEMENT	DETERMINATION OF STANDARD	APPROVAL	OTHER AGENCY, PUBLIC INVOLVED
v-66-B	Surface rehabilitation plan	60 days before start of mining; annual update	Include detailed information on activities, schedules, standards, accomplishments, and methods of eliminating or minimizing oil shale development impacts		M.S.	
v-67-C	Stabilization of disturbed areas		Shall leave all disturbed areas in a stabilized condition" Repeat plantings if "unsuccessful"			
v-67-D	Correction of surface disturbance on site	During or after construction or mining	Surface rehabilitation plan			
v-68-E	Avoidance of unstable soil areas, make soil foundation studies	During construction and operation	"Where possible," when cannot be avoided, "shall design construction to insure maximum stability"		M.S. may request study data	
v-68-F	Utilization of waste rock from mining	During mining	"When feasible," when not feasible, purchase materials	Purchase, 43 CFR 3610	M.S. approves sale of materials from some areas	
v-68-G	Maintenance of cut and fill slopes in stable condition	Duration of lease	"To the extent consistent with good mining practice"			
v-69-H	Grade of excavations for permanent water impoundments		To establish safe access to water for persons and animals			

Table 2. --Continued

PAGE	OBJECTIVE	TIME FRAME	STANDARD OF ACHIEVEMENT	DETERMINATION OF STANDARD	APPROVAL	OTHER AGENCY, PUBLIC INVOLVED
v-69-I	Limits on construction and operations in flood plains		When "it is reasonable" to expect risk, damage or pollution as a result		Express permission of M.S.	
v-69-J	Reclaim operation areas (backfill, level, final grade, cover with topsoil, initiate revegetation)	When "no longer needed" but not later than 1 yr after completion of operation	Surface rehabilitation plan		Unless otherwise directed by M.S. M.S. may approve alternative time schedule	
v-69-K	Separation, stockpiling of overburden				"Unless otherwise directed by the M.S."	
v-70-L	Revegetation of disturbed lands	"As soon as possible" after disturbance	"To minimize and, if possible, to prevent erosion and related problems	Lessee chooses one of three conditions	M.S. approves plans	
v-73-B	Disposal of waste other than mine waste		By recycling, sanitary landfill "to the extent practicable"	State, U.S.P.H.S. and E.P.A. applicable standards and guidelines	"In a manner acceptable to" M.S.	

The final statement should contain the following with regard to the lease and stipulations, in order to be an adequate statement.

1. Clear, unambiguous language describing standards of success to be attained.
2. Presentation of alternative stipulations
3. An accurate, detailed picture of the existing environment, expected impacts, and mitigation measures.
4. A monitoring program independent of the lessee conducted by an independent agency such as the Environmental Protection Agency.
5. Limitation of the Mining Supervisor's area of authority to subsurface matters; extraction of ore, and conservation of minerals.
6. Establishment of an approval board composed of representatives of scientific disciplines in governmental agencies (local, state, and federal) and representatives of the public.
7. Stabilization, reclamation and revegetation standards be ecologically based decisions, made independently of the lessee.
8. Strict provision that overburden must be separated and stockpiled; top soil must be used as top dressing. Revegetation without this stipulation will be extremely difficult, if not impossible, to achieve.
9. Strict provision that all agreements, plans, data, reports, memoranda, files, etc., concerning oil shale leases and stipulations be open and available to the public.
10. Cost estimates of reclamation.
11. Protection and standing of wildlife equal to that given land, water and air in 43 CFR 23.1. The omission of wildlife is a serious oversight which would have major detrimental consequences.
12. The draft lease includes provision for a performance bond of \$500 minimum per acre, but not less than \$2,000 (III-v-30). While we support the use of performance bonds, the final should discuss who determines the bond amount and what criteria are used to set the amount.
13. Although the lessee may relinquish the lease under certain conditions, it is not clear under what conditions the Government can cancel the lease or force relinquishment in the public interest. These conditions need to be clarified in the final draft.

#### Irretrievable Resource Commitment

The full scope of the environmental impact of oil shale development cannot be determined from the draft due to the scanty, vague or non-existent information on the location, size, type and environmental impact of secondary facilities necessary for oil shale development to occur on the lease tracts. Some examples: "Small plants may be required to generate electricity for oil shale processing" (I-i-62); "In the White River it may be possible to obtain water from the proposed Yellow Jacket Project, Rio Blanco Reservoir, or Sweetbriar Reservoir if they were constructed by the time water is required." (III-iv-17); "Access roads, power and gas transmission facilities, water lines, and oil pipelines would need to be constructed." (I-iii-19).



A detailed discussion of the environmental impacts, in addition to the acreage figures given and general statements about impacts, of dams, water diversion and supply systems, power plants, pipelines, roads and alternatives must be included in the final statement. The tests for inclusion are: Would this secondary facility be necessary if there were no oil shale development? and, Is oil shale development on the lease tracts viable in isolation, possible without this secondary facility?

The final statement should include an assessment of the long-term environmental impacts of the stabilization, impoundment, and reclamation structures and facilities which remain after production has ceased. The draft (III-vii) assumes that the greatly altered conditions in the ecosystem will exist in equilibrium. However, this man-made environment will require maintenance; otherwise the processes of erosion, leaching, seepage, etc., will gradually undo the careful rehabilitation of the lease lands.

The final statement must address the costs of maintaining these structures and the question of who pays the costs. Will the costs become a local, state or federal obligation on public lands or will the lessee continue to bear the costs after the lease has terminated?

Section III-viii sums up the draft statement in its discussion of the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. Shale oil prototypes are experimental production plants, but this section unrealistically considers only the case that the experiment (prototype) proves completely successful. The final statement should include assessments of the impacts of partial and complete failure of the experimental oil shale development, such as:

--What irretrievable commitments of water and wildlife would be made if oil shale development failed? What trade-offs would the public be required to make?

--What economic and sociologic long-term burdens would be placed on communities in the oil shale region if oil shale is a boom-bust development? What adjustments would be required of the plant labor force and of community businesses during periods plant shutdown to await more favorable oil markets?

#### Other Comments

With regard to impact on Indians (III-iv-59), the fact that there is no sizable community does not imply that there will be no impact, since litigation may establish legitimate Indian claims to Piceance Basin lands.

## Alternatives, Volume II

The draft does not present a serious discussion of alternatives to oil shale development including the null option. For example, the dismissal of geothermal electric power as "insignificant" in the draft is not supported by other studies such as the major one soon to be released by the Office of Science and Technology. This deficiency of the draft is discussed in greater detail by other reviewers.

Alternative oil shale policies are not adequately presented in the draft (II-60-8).

--The draft justifies the present leasing program on the rationale that it adheres to the outline in the Public Land Law Review Commission report (p. 62). We emphasize that:

- a) The PLLRC report is a compilation of recommendations and suggestions, it is not a body of law.
- b) Many reviewers criticized the PLLRC report for its bias toward easy access to developing the public land resources and its apparent disregard for the public long-term interest.

It is not at all clear why the feasibility of oil shale prototype development should not be first proved on private lands before a decision is made to lease public lands. The final must address this major weakness in the draft.

The draft states (p. 61) that "Clearly it is not the intent of Congress to establish such a precedent (four optional policies listed previously on p. 61) as it pertains to mineral resources. The policy of Congress embodied in the mineral leasing laws has been recently supplemented by the Mining and Minerals Policy Act of 1970. . . ." We point out that:

- a) The mineral leasing laws date from 1920 and cannot be described as reflecting the intent of modern-day Congress.
- b) No Congressional review permitting citizen comment on the proposed oil shale leasing program has been undertaken.

## Conclusion

No decision to proceed with the leasing program can be justified until after:

--Formulation of a national energy policy, as described in the COSC position paper (See Attached).

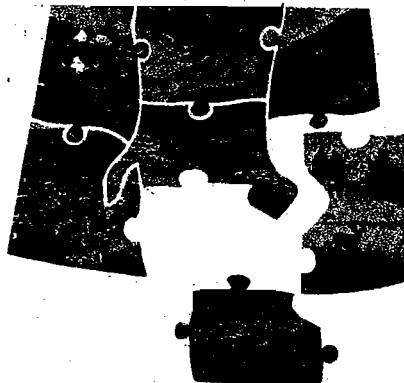
--The environmental and economic feasibility of oil shale development has been proved successful on private lands.

--Design and completion of an environmental research program. The Colorado studies now underway would be one phase of this program.

Respectfully submitted,

*Carolyn R. Johnson*  
Carolyn R. Johnson

Chairman, COSC Mining Workshop  
Co-Chairman, Oil Shale Committee



# COSC

*Colorado Open Space Council, Inc.*

1742 PEARL STREET, DENVER, COLO. 80203

## POSITION STATEMENT

of the  
Colorado Open Space Council  
regarding  
OIL SHALE DEVELOPMENT

NOV 6 1972

### JUSTIFICATION AS AN ENERGY SOURCE AND VALIDITY OF AN OIL SHALE INDUSTRY

#### I. IS OIL SHALE DEVELOPMENT A VIABLE INDUSTRY?

Success on private lands: If an industry utilizing oil shale energy is a viable enterprise, it should succeed on private lands first before it should be permitted on the public lands. Industry should be willing to develop their own lands first. To date, there is little evidence that it is a viable industry by these standards.

Burden of Proof: However, because the Administration has initiated an oil shale program on the public lands, it is incumbent on the Interior Department to prove that the oil shale development efforts provide the basis for a feasible industrial development which would benefit the public. In order for citizens to evaluate the progress and economic benefit to them of the experimental industry, we call for a full disclosure of the results of existing pilot plants.

Possible Government Subsidy: If an oil shale industry is to be economically feasible, it should not be subsidized by the Federal or State governments. Feasibility on the public lands may be attained when technology makes it possible to extract the deposits in full with the least impact on the environment and provides the means to rehabilitate the environment. (Note that present extraction procedures recover about 40% of oil shale resources. Anything less than full extraction efficiency is a wasteful use of our energy resource.) Possible forms of subsidy could include:

(a) Cheap Water - Waters to be used by a potential industry should not be imported or piped into the oil shale development areas of the Green River Basins at taxpayer expense or without adequate environmental evaluation and protection by any Federal agency having the jurisdiction.

(b) High land purchase investment vs. low leasing costs - Leasing contracts on the public lands should be let at reasonably high competitive rates, rather than unreasonably low rates.

(c) Feasibility definition on the public lands - Economic feasibility should be defined with the social cost built into the

cost of the product. This means that the environmental quality standards for environmental protection (a quantitative estimate) and reclamation becomes a part of the cost for the developer. The social cost should be ecologically based.

## II. CLEAN ENERGY?

President Nixon's message of June 4, 1971, announcing approval of an oil shale development program on the public lands implied that oil shale was a "clean energy" source. Even rich oil shale is about 87% rock or inert material, and per ton it averages only about a half a barrel or 25 gallons of crude oil. The tailings from spent oil shale fluff up to become around twice the volume of the original rock. In greenhouse experiments, tailings grow nothing unless supplemented by fertilizer and constant watering. In other words, the tailings are quite sterile in their own right.

In the opinion of many, the tailing problem is so enormous that oil shale development potentially may be one of the most damaging industries to the environment.

## III. RELATION TO OTHER FUTURE ENERGY SOURCES

Needed: A COMPARATIVE REVIEW OF POTENTIAL FUTURE ENERGY SOURCES, and A NATIONAL ENERGY POLICY. Assuming that the development of oil shale energy may one day be economically and environmentally feasible, the public and its governmental agencies need to have a comparative and comprehensive review of all energy sources in order to put oil shale in perspective; i.e., how does oil shale compare with solar, tidal, nuclear, geothermal, magnetohydrodynamic and fusion energy or with other fossil fuel sources? If the oil shale resource is mainly to come from the public lands, the public has a right to ask the government to identify the role of oil shale within a succinct energy development plan. Such a plan, the basis for it, and the Federal justification for oil shale development within the context of the plan shall be made available to the public for review and amendment.

## IV. SOCIOLOGICAL NEED, ECONOMIC JUSTIFICATION, AND SOCIAL AND ENVIRONMENTAL IMPACT

In order for the public and the Government to make a proper evaluation of oil shale that might be developed on the public lands, there should be studies of the sociological need, social impact of the industry, and economic justification--in addition to environmental studies--carried out at public expense. A review of some of these factors might be carried out by such groups as Resources For the Future (i.e. John Krutilla) and the National Academy of Sciences.

## V. WHAT IS THE HIGHEST AND BEST USE OF OIL SHALE?

Before the Federal government can expect the consensus of the public to permit the development of a new energy source on the public lands, the agencies should identify and make public as well as have control over the uses to which the oil shale will be put. The Committee on Resources and Man in the National Academy of Sciences has stated that if, in the long run, the world's principal industrial energy requirements can be supplied by methods other than burning

fossil fuels, it would be desirable to conserve the remaining fossil fuel resources for chemical purposes. Additionally, if the oil shale petroleum or products are to be used for export, then perhaps it would not be worth mining the public lands for such a purpose.

## PROPOSED OIL SHALE LEASING ON THE PUBLIC LANDS

### I. ENVIRONMENTAL QUALITY STANDARDS:

Oil shale leasing on the public lands in Colorado should begin only after appropriate restrictive environmental quality standards are designed and agreed upon on the citizen level. Development of these standards should be the responsibility of the Governor's Committee on Environmental Protection for a Federal Oil Shale Leasing Program, with the help of the research contractor who will work according to Committee directives during 1971 through the fall of 1973. T.W. Ten Eyck, Director of the Colorado Department of Natural Resources has given the Committee two charges: (1) to plan the study for an "adequate environmental resource inventory", and (2) to make "appropriate land use planning policy recommendations for use in any future oil shale development program". For responsible long-term development both charges must be fulfilled. Environmental Quality Standards are a logical part of the land use planning policy recommendations, and should incorporate the results of the inventory program carried out by the study contractor in the Piceance Basin study area.

### II. ENVIRONMENTAL IMPACT STATEMENTS:

ELM and other land administrative agencies anticipating possible leasing to oil shale developers should publicize both draft and final Environmental Impact 102 statements under the Environmental Policy Act and according to the CEQ Guidelines of April 23, 1971. It is hoped that this will insure that the basic information upon which the agency bases its decision to accept contract bids is fully reviewed and understood by the public. Environmental impact statements should be completed and reviewed before Special Use Permits or Exploration Leases are let, as well as before full scale industrial leasing is considered for the public lands. Environmental statements based on present studies are unacceptable because the studies have been inadequate.

### III. EVALUATION OF QUALITY STANDARDS AND 102 STATEMENTS:

Copies of draft and final reports should be printed at Government expense, with adequate copies for general public review. Liaison by the Director of Natural Resources and his Committee with public groups should be planned after an initial draft of environmental and energy considerations is designed.

### IV. WATER DEVELOPMENTS:

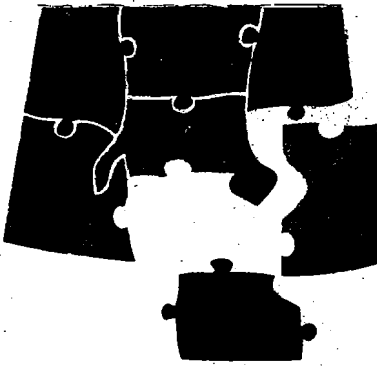
To minimize regional environmental degradation and disruption, water to support an oil shale industry should be taken only from local water sources in the Piceance Basin. Lease terms should require that the water utilized be from a pool that is continually recycled.

V. IMPLEMENTATION

If the sociological and economic review studies indicate that there are real and compelling reasons to go ahead with an oil shale leasing program on the public lands, then the Environmental Quality Standards designed by the State should be written into the leases offered for bid to industrial companies in order to implement the protective restrictions designed by the State Committee and by the public. These standards should be applied for exploratory, special use permits, and long range leasing.

We, as citizens, want to avoid the lax lease terms that caused so much turmoil, environmental degradation, and after-the-fact public hearings at the Black Mesa coal burning plants in Arizona and New Mexico.

July, 1971  
OIL SHALE COMMITTEE  
COLORADO OPEN SPACE COUNCIL  
1742 Pearl Street  
Denver, Colorado 80203



# COSC

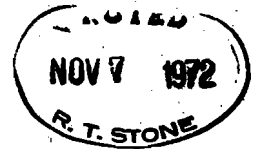
*Colorado Open Space Council, Inc.*

~~5850 E. JEWELL, DENVER, COLO. 80222 - AREA CODE 303-736-3391~~

1742 Pearl St., Denver, Colo. 80203 303-573-9241

November 3, 1972

James M. Day  
Director, Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington Virginia 22203



Dear Mr. Day:

Enclosed are the comments of the Mining Workshop of the Colorado Open Space Council on the Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program issued September 1972.

We request that these comments be made part of the official hearing record.

Please note that our report contains an appendix and that the health and safety portion of our comments is arriving under separate cover.

Sincerely yours,

*Carolyn R. Johnson*

Carolyn R. Johnson

Chairman, COSC Mining Workshop

Co-Chairman, COSC Oil Shale Committee

encl.

OFFICE OF

NOV 6 1972

(122)

HEARINGS & APPEALS



# COSC

*Colorado Open Space Council, Inc.*

5850 E. JEWELL, DENVER, COLO. 80222 - 303-756-3081

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1742 Pearl St., Denver, Colo. 80203 303-573-9241

Comments of  
Colorado Open Space Council  
Mining Workshop

on

Draft Environmental Impact Statement  
Prototype Oil Shale Leasing Program

OFFICE  
NOV 6 1972

November 3, 1972



## Introduction

The guiding principles behind the writing of the draft statement are nowhere laid out in a coherent and compact form, leaving it to the reader's imagination and powers of inference to establish the contextual importance of the document. Fragments that provide hints of guidance include the introductory comments pertaining to the "general purpose" of the study: simply, it is "a study of the environmental impacts of oil shale development." The reader is further informed that "The impact analysis included herein is considered to constitute a reasonable treatment of the potential environmental effects. . . ." incorporating the "best judgment" of "departmental experts." Who "considers" it "reasonable" and why are not explained. Volume III, pp. i-4 to i-7, tells little more--only that "complete economic evaluation of total environmental costs" was a desideratum of several other studies, that these studies did not provide enough specific information for evaluating environmental impacts, but that "These detailed environmental studies containing (sic) the known prevailing conditions against which the estimated environmental impact can be measured." (III-i-7)

Assured of the expertness of the compilers of the document (I-3), we wonder why the physical properties of the document are so deficient: no apparent editing, lack of coherent organization, repetition, and sloppy grammar and syntax.

## Environmental Impacts

Taking the document as a conscientious attempt by experts to delineate and analyze the environmental impacts of oil shale development so that intelligent policy decisions can be made with its guidance, we can only suppose that the policy makers are blessed with infused divine wisdom, or that they are prepared to decide in a state of ignorance. If the experts know something concrete and credible, they have not revealed it in the document, beyond their discussions of the techniques of shale processing. The environmental impact discussions are resolutely phrased in generalities and are essentially devoid of hard data. There is one statement of cost data: II-148 provides some cost estimates for repairing damage from coal strip mining. No one would deny the extreme difficulty, even for experts, of estimating even order-of-magnitude environmental effects and of attaching monetary values to these effects. Yet, the effort has not been attempted. It can be done--See Fisher, Krutilla, and Cicchetti.<sup>1</sup>

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<sup>1</sup> "The Economics of Environmental Preservation: A Theoretical and Empirical Analysis" in American Economic Review, Sept. 1972, pp. 605-19.

Attached is a tabular presentation of the almost complete failure of the draft statement to provide information upon which to base intelligent comparisons and evaluations of the environmental effects of the leasing program. This serial listing of the defects found only in Volume III and only for Colorado tracts is damning enough without the added fatal fault that nowhere in the report is there any evidence of an effort to apply "best judgment" to these impressionistic "facts" so as to produce an interpretation of the confluence of effects on their overall order-of-magnitude impact.<sup>2</sup>

Public statements by relevant officials, for example Colorado Governor John Love<sup>3</sup> and Assistant Secretary of the Interior Harrison Loesch<sup>4</sup>, have asserted that oil shale development will not proceed if the environmental damage is too great. Yet, the draft contains no criteria for determining when the level of damage becomes unacceptable. The final statement should include a set of measurable criteria for making this key decision, a designation of an independent agency to obtain these data, and an independent committee of public officials and citizens who will consider the data and make the decision. Without these safeguards, there can be no independent control over oil shale development, and public officials' guarantees such as those referred to above are vacuous.

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<sup>2</sup>(III-iv-52) The tourist demand for such a "scenic vista" has not been established. Applying our best judgment, we conclude that the present supply of these vistas in the Rocky Mountain Region exceeds all projected demands.

<sup>3</sup>Statement at Denver hearings, Oct. 10, 1972, by Thomas Ten Eyck for Governor John A. Love.

<sup>4</sup>Interview, Denver Post, Oct. 17, 1972.



COSC

*Colorado Open Space Council, Inc.*

5850 E. JEWELL, DENVER, COLO. 80222 • AREA CODE 303-756-5991

Mr. James M. Day  
Director, Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia



Mr. Day:

We wish the following comments included in the official record. Please include this with the other C.O.S.C. Mining Workshop statement coming in under separate cover.

Sirs:

The Colorado Open Space Council Mining Workshop is concerned about different aspects of environment, and one of the most important is the working environment. The preliminary impact statement was noticeably lacking in information regarding the health and safety of the miners. Throughout the entire 1150 pages, all reference was made toward production and environment, not one page referred specifically to health and safety except to mention that 1100 deaths would occur by 1985. Therefore, we have many unanswered questions on this subject and feel clarification is necessary before any further decision is made on the oil shale leases.

The room and pillar operation is outlined in very sketchy form and particularly concerns us. We would like to see more complete diagrams concerning the ventilation system and emergency exit portals. This data shouldn't be privileged information because it concerns human life and death. We are also interested in learning about the proposed electrical systems for both underground and surface operations. What methods of

dehumidifying and draining the mines are proposed? And what guarantees are there that the mine will not be under or over dehumidified?

Could the "noxious gases" associated with the room and pillar operation please be identified for us? Are these gases of an explosive nature? Could they asphyxiate? Are they flammable? What procedures will be used to prevent accumulation? Could the presence of diesel trucks, explosives and dynamite cause the gases to explode? And in conjunction with that question, just what kind of explosive is ANFO? What regulations are there setting limits on the amount used and conditions that are allowable for it's usage?

The impact statement mentioned 1000 tons of dust a day in this underground operation. What kind of dust is this and what is its flammability? What measures will be used to control it? How does it compare to coal dust? Has there been any medical testing done to determine if this dust could cause lung diseases similar to silicosis or Black Lung?

The Mining Workshop also feels the roof control and roof bolting programs should have been included in this statement. What governmental agency will approve these plans? What patterns have previously been tried and approved in oil shale rock? What is the history of roof falls in this operation and how do these falls affect the men as compared to coal mining.... are the injuries more or less severe?

And foremost among our questions, what type of formal training program will be given to all employees.....underground, surface, in-situ, processing plant, haulage, etc.? Have these programs been scrutinized by the governing agency? What special positive programs besides those outlined in the laws will be instigated by the governmental agency and the employers?

According to the impact statement, Volumn 1, pps. 386-387.....

"Though health and safety statistics are available for both underground

and surface mining operations, the technologies involved in oil shale mining and processing makes it anticipated to be more closely aligned to surface mining in terms of fatalities and accident rates." Sirs, could you agree that deep mining can be comparable to surface mining statistics?

Secondly, the oil shale statistics should not be patterned after those of the coal industry's. The Bureau of Mines is admittedly a production oriented-not a safety oriented - agency. This trend of thinking must be reversed -- not duplicated. Your thinking is catastrophic to mention 1100 deaths and not deal with ways to prevent them. The oil shale industry should start out with different standards and priorities than the coal industry. And the human life is the first priority.

Therefore, we feel these questions must be answered in the final impact statement so the public can evaluate your concern and precautions.

Respectfully submitted,

*Mrs. Sue Bollman*

Mrs. Sue Bollman  
Vice-chairman, Mining Workshop

OFFICE OF

NOV 8 1972

*Wilderness Workshop*  
of the  
*Colorado Open Space Council*



HEARINGS &amp; APPEALS

November 6, 1972

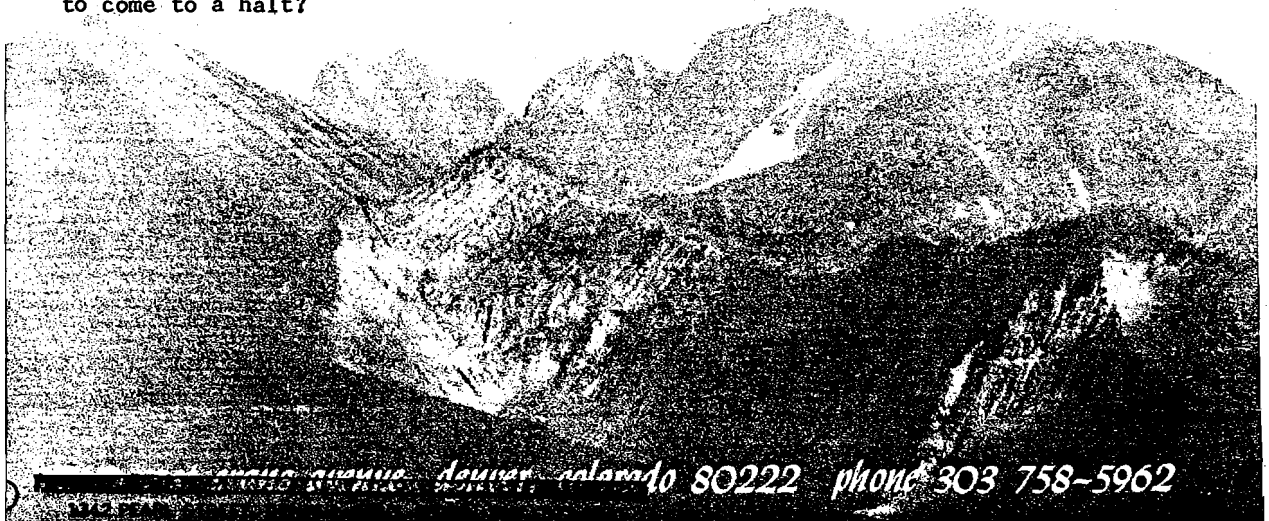
WRITTEN ADDENDUM TO ORAL STATEMENT BY CHARLES WANNER, REPRESENTING THE WILDERNESS WORKSHOP OF THE COLORADO OPEN SPACE COUNCIL, WHICH WAS PRESENTED OCTOBER 10, 1972. Please incorporate this statement in the formal hearing record.

As promised at the hearing in Denver, the Wilderness Workshop of the Colorado Open Space Council submits these comments on the draft of the "Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program." Our comments refer to specific areas of the report and are listed in the order that these areas appear in the report with appropriate citations.

1) Vol. I, Chapter 1, pp 14-16

On these pages, two waterless retort methods are described (The Union Oil Retort and the Gas Combustion Retort). Both of these methods seem to have been rather extensively researched. The report indicates that the Union Oil Process has promise but that economic conditions and energy <sup>demands</sup> do not yet warrant it. It seems that when a true demand for energy exists, these processes will be feasible; and that while the price to the consumer could well be higher, the general public will not be paying the social costs attendant to the damaging of wild rivers and lands by the consumption of large quantities of water. not so

There is no real reason given in the entire report as to why waterless development would be unfeasible if market conditions were right and further why we cannot wait for demands to create those market conditions. Further, why has research on the gas combustion retort, apparently, been allowed to come to a halt?



1112 PEARSON DRIVE, DENVER, COLORADO 80222 phone 303 758-5962

2) No citation

If shale oil production is feasible, why is it not being done on private property, wholly with private funds?

3) Vol. I, Chapter 3, p. 39

Will there be an increase in the salinity of the Colorado River and will the royalties or some other fee paid by the oil companies pay the estimated \$67,000 per ppm per year which the Bureau of Reclamation has assigned to this increase in salinity or must the public lands be used to create this nuisance while public monies are used to de-salinize the Colorado River so that we can meet our commitments to Mexico?

4) Vol. I, Chapter 7

This chapter simply cannot be commented upon politely. It is totally inadequate and obviously glosses over the subject of "Irreversible and Irretrievable Commitments of Resources". It is not objective statement of fact; it is poor apologetics.

5) All socio-economic comment in the Draft Statement seems based on the assumption that oil shale will remain a supply of energy for decades. No discussion of the impact of the cessation of such activities after several decades is ever considered. The question is this: Are we to have another Appalachia? Obviously, this question is not within the purview of the impact statement. However, the question of the termination of the prototype project should be considered as future oil shale development might not be evenly distributed in the three state areas. This could have far-reaching fiscal and social implications for communities in the area.

6) Vol I, Chapter 2, p. 25

The report states; "Little systematic investigation of the Colorado River Basin fishes has taken place since 1900, and the status of many species is unknown. Existing information indicates that the region has retained a large number of native species unique to this area. Several of these may soon be classified as rare or endangered." This research should be done before the environment in these rivers is further changed by oil shale development, as it apparently will be.

7) The apparently required restoration water does not appear to be calculated or ascribed to a source anywhere in the impact study.

8) Vol. I, Chapter 3, p. 57

In paragraph "e", entitled "Degradation of Water Quality", once again there is a substantial question about what the effects of the project really will be. When this is stated in regard to two major rivers in the Colorado River Basin, it constitutes a major gap in the assessment of the impact of the project.

9) Vol. III, Chapter 1, p. 3.

In the statement of the goals of the program, "timely development of commercial oil shale technology" is mentioned. It seems that if this development were indeed "timely", private enterprise would develop the needed technology in response to the demand for oil shale products and would be willing to use their own lands for that purpose.

10) Vol. III, Chapter 1, p. 13.

The statement under the heading "Bonding", which reads, "Provision could be made to credit extraordinary environmental costs, that may develop after the lease issuance, against the royalties otherwise due the government" should be deleted. This constitutes a subsidy in the form of "environmental insurance". In addition, the more oil that is extracted, the greater the royalties due the government and the more damage which can be covered by these royalties. This means that if you make more money through higher production, you can do more cost-free damage. This could be an incentive to less environmentally sound production techniques.

11) Vol. III, Chapter 4, p. 3

The return of spent shale underground where possible seems to be only a possibility and not a certainty. Indeed, it does not seem to be stipulated in any lease agreement. No explanation seems to be made of why it is not stipulated.

12) Vol. III, Chapter 4, p. 32

"The impact of these emissions on ambient air quality has yet to be established", reports the Statement. This is an extremely serious flaw in the process of assessing an environmental impact.

13) Vol. III, Chapter 5, p. 45

The Mining Supervisor and the Lessee should not be able to amend the stipulations without the oversight of some third party. Generally, the description of the Mining Supervisor position almost insures that there will someday be the problem of separating the interest of regulators and regulated.





## THE CONSERVATION FOUNDATION

1717 Massachusetts Avenue NW Washington DC 20036 • (202) 265-8882 Cable: CONSERVIT

November 7, 1972

Mr. James M. Day  
Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

OFFICE OF  
NOV 8 1972

HEARINGS &amp; APPEALS

Dear Mr. Day:

Herewith are comments of the Conservation Foundation on the draft environmental-impact statement issued by the Department on the proposed prototype oil shale leasing program.

We appreciate the opportunity to review and comment on the environmental aspects of this significant proposal.

Sincerely,

Arthur A. Davis  
Vice President - Operations

Enclosure



COMMENTS OF THE CONSERVATION FOUNDATION ON THE DEPARTMENT  
OF THE INTERIOR'S DRAFT ENVIRONMENTAL-IMPACT STATEMENT OF  
SEPTEMBER 1972 ON A PROPOSED PROTOTYPE OIL-SHALE LEASING  
PROGRAM

The comments which follow are not a comprehensive response to the many issues involved in the draft environmental-impact statement. Rather, they are limited to brief discussion of energy conservation, certain adverse environmental impacts, off-site land-use impacts, proposed lease terms, and the question of whether six sites in three states are necessary. Five recommendations, addressed to the substance of the proposed program as well as to the requirement of the National Environmental Policy Act for an adequate impact statement, are offered.

## Energy Conservation

We welcome the draft impact statement's discussion of energy alternatives to shale oil development, but note that the projections of total energy consumption presented in the "Energy Alternatives" section of the statement (Volume II) are considerably higher than those now projected as "the most probable" by the U.S. Bureau of Mines.

More importantly, we must question the attitude reflected in the impact statement's assertion that reducing the projected demand for oil by 1985 by one million barrels per day (the targeted shale-oil production for that year under the Interior Department's proposed leasing program) "would be extremely difficult" to implement "in the time frame of this report." This view directly contradicts that of a federal interagency staff study directed by the Office of Emergency Planning whose October 1972 report, "The Potential for Energy Conservation," states that there exist a variety of practical means for reducing the projected demand for petroleum by six million barrels per day by 1985, six times the targeted shale-oil production for that year.

In view of this conclusion, the Federal government, including the Department of the Interior, surely bears responsibility to pursue a policy of demand reduction with the same vigor by which it is now seeking to increase supply. We can, however, see nothing in the Department's attitude toward shale oil, as

expressed in the draft impact statement or otherwise, to indicate that this change of philosophy has begun to occur. (The attached paper, by Dr. David B. Large, Senior Associate of the Foundation, expands on this view of the Interior Department's posture toward energy conservation.)

The impact statement discusses reduction in demand for energy at pages 68-73 of Volume II. This does not, we believe, constitute an adequate discussion of this quite practical alternative to going ahead now with stimulation of a new industry with admitted adverse environmental impacts and major environmental unknowns. We believe that this inadequacy alone is enough to find the impact statement a fatally deficient response to NEPA's mandate that "alternatives to the proposed action" be discussed in detail in the impact statement.

#### Adverse Environmental Impacts

The impact statement reports that some effects of the proposed program on environmental quality are both adverse and unavoidable. These adverse and unavoidable impacts include depletion of both ground-water and surface-water supplies, worsening of the already unfavorable concentrations of salts in the Colorado River, lowering of air quality, loss of wildlife and vegetation, and changes in the landscape.

Concerning water quality alone, for example, the impact statement says (page V-3, Volume I), that diversion and net consumption of water resources for this new industry would deplete

natural streamflow in the shale area. This, in turn, would increase the salinity concentration of the Colorado River (at Hoover Dam) by a "maximum of 1.4 percent" for a one million-barrel per day industry, "not taking into account other salinity influences that could occur from accidental releases from production operations, surface-water runoff, and water-table depression." The statement also notes that, in addition, the disturbance of ground-water by mining operations, or by water used to return spent shale underground for disposal could have an adverse effect on subsurface-water quality, ground-water movement, water levels, spring-flow, and stream-flow. The statement says that "Knowledge of aquifer characteristics, head relations and chemical quality distribution in the aquifers in much of the region is inadequate and the extent of this impact cannot be predicted." The statement adds that specific information developed during core drilling and on-going research might reduce the risk of adverse impacts on aquifers, and that close monitoring of the quality of ground-water and prompt action to change operations detrimental to water quality would help mitigate adverse effects.

The report generally lacks explanations of the significance of the environmental effects of diverting great quantities of water in an arid region to this proposed new industry. What, for example, will it mean to downstream users of Colorado River water if salinity of the river is increased by the full amount anticipated, taking into account all influences on salinity?

We are advised that Colorado River water now supplying Los Angeles, San Diego, and Mexico (by contract or treaty with the United States) already is below U.S. Public Health Service standards -- without a shale-oil industry in the Colorado River basin.

In addition to water quality, the statement concedes that there are significant "unknowns" for the other categories of "adverse and unavoidable" environmental effects noted earlier: air quality, fish and wildlife, vegetation, land distribution.

Recognizing this lack of knowledge, the Department earlier this year contracted with the State of Colorado and private interests for a two-year program of oil-shale environmental studies in Colorado. This program, financed jointly by the oil industry, the federal government, and the State of Colorado, is underway and scheduled for completion in mid-1974. Specifics on which knowledge is being sought include ground-water and aquifer characteristics, land-use analyses, and an environmental inventory of the shale area.

(The attached paper, by Glen D. Weaver, of the Department of Geography, University of Wisconsin - Milwaukee, prepared with grant support from the Foundation, comments on the possible and avoidable, as well as unavoidable, adverse environmental impacts of the proposed program.)

### Lease Terms and Stipulations

A number of the terms and stipulations in the proposed lease forms in the draft impact statement (Volume III) are questionable from an environmental point of view.

They raise problems, for example, of the lessee regulating himself and of too-broad discretion lodged in the federal "mining supervisor." The lessee himself, rather than a federal employee, is expected to "prepare" and conduct the environmental monitoring program on his site. And the mining supervisor would be given authority to waive various environmental safeguards; he, with consent of the lessee, can change significant environmental terms and stipulations of the lease.

Recognizing that conditions may change and that the original lease terms may need to be revised, we suggest that any changes or corrections in the environmental terms and stipulations of any oil-shale leases should be made only by the Secretary of the Interior, rather than by low-level employees of the Department who cannot be held responsible to Congress or the public.

### Off-Site Land-Use Impacts

The statement does not, in our opinion, present sufficient analysis of the probable environmental impacts of a mature oil-shale industry on nearby "off-site" lands, and of the adequacy of existing land-use controls over these non-federal lands.

The statement notes, for example, that Colorado and Wyoming (but not Utah) have zoning and subdivision regulations in effect which, "if properly administered," could ensure orderly development (Volume I, III-804). The statement also notes that "shanty town" developments could be one result of the proposed program. Why need this be so? Why should not "proper administration of land-use planning and regulation laws be a condition of the program?

Why, for instance, should not one condition of a federal go-ahead on this program be a commitment by any state involved that it will assure that environmentally adverse off-site impacts will not be permitted -- through exercise (to federal environmental standards) of the state's constitutional powers to regulate land use? The governors of the three states involved, and the governing boards of the local governments involved, appear to desire this program; they should be willing to provide the necessary assurances that this proposed new industry within their jurisdictions will be good for their local environments, as well as local economies.

### The Political Symmetry of the Site Selections

We question the necessity for production on six sites -- two in each of the three states in which shale oil is found on federal land in sizable quantity. We are skeptical that this political symmetry is grounded on expectations that



significantly different knowledge may be gained from each site; we are skeptical that this feature of the proposal is so much designed to produce knowledge of production technology and environmental effects as it is to provide an aura of equality among the three states.

If our skepticism is justified, it would not be the first time that rational management of the natural environment has been skewed by man-made political boundaries. But it would be one of the less defensible examples of irrelevant political considerations controlling environmental decisions.

The two Wyoming tracts, particularly, appear to call for unnecessary and duplicative efforts in the types of mining technology involved and appear to be proposed for political reasons alone.

We believe that the alternative discussion of the impact statement cannot be considered adequate until it is supplemented by a consideration of reduction in the number of sites as an alternative to the proposed action.

### Recommendations

We recommend to the Secretary of the Interior that a final environmental impact statement on the proposed prototype oil-shale leasing program should not be filed and the program should not go forward --

1. Until the Department of the Interior has demonstrated that it is actively pursuing and promoting a policy of demand reduction, based on energy-conservation principles, with the same vigor by which it is now seeking to increase energy supply.
2. Until commitment has been made by the governors of the states directly involved that they will regulate uses of nearby non-federal lands to

meet federal environmental criteria and standards, so as to prevent adverse off-site impacts caused by the proposed program. For such commitment to be credible, some new laws and land-use control processes are going to have to be enacted and established.

3. Until the number of prototype sites has been reduced from six sites -- two in each of three states -- to the absolute minimum required to gain essential knowledge of how to produce oil from shale with minimal adverse impact, or until a persuasive case has been made that six sites are essential for these purposes from an environmental standpoint.
4. Until a favorable report, recommending that the proposed program go ahead and specifying recommendations for the environmental terms and conditions, has been submitted by an Advisory Commission on the Environmental Impacts of Oil-Shale Development. Such a commission should be appointed jointly by the Secretary of the Interior and the Administrator of the Environmental Protection Agency; it should be interdisciplinary and representative of all the significant public interests in the federal oil-shale lands, and should not be dominated by any private or regional interest.
5. Until the Colorado-Interior Department-private industry environmental study of oil-shale development, scheduled to be completed in 1974, has been completed and its information and recommendations incorporated into the final environmental impact statement.

## NEW USE FOR AN OLD ETHIC:

### ENERGY CONSERVATION

David B. Large  
Conservation Foundation\*  
1717 Massachusetts Avenue, NW  
Washington, D.C.

The notion that the economic and environmental costs of our accelerating energy consumption are beginning to strain our ability to pay is now commonplace. Concern about "the energy crisis," an amalgam of economic, political, social and environmental issues, has produced a profusion of congressional hearings, conferences, lengthy studies, and much heated debate. (One industrialist was quoted recently as saying that the solution to the energy crisis is simply to burn all the energy studies for fuel.) Predictions about how much petroleum, natural gas, coal and uranium, the principal energy fuels, remain to be recovered in the United States vary widely, depending upon one's assumptions. But there is a consensus that unless growth slows, we are approaching a point at which most of the economically recoverable reserves of natural gas and petroleum in the United States will

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\*The views expressed are the author's, and not necessarily those of the Conservation Foundation.

be exhausted within a very few decades. Recently, our response to shortages has been to increase imports -- we already import one quarter of our petroleum; and the U.S. Bureau of Mines is predicting that this will be up to one-half by the early 1980's. However, both national security and balance of payments considerations have government planners extremely jittery about the implications of that degree of reliance upon foreign sources.

Predictably, the energy industries have responded to the spectre of a supply-demand gap by pushing for increased exploration and production, appealing for less federal regulation, more tax incentives for exploration, and a relaxing of environmentally motivated controls. Meanwhile the damage to the physical environment which necessarily accompanies the production, distribution and consumption of energy continues to increase, and battle lines have already been drawn over such controversial projects as off-shore drilling, the trans-Alaskan pipeline, strip mine regulation, and the proliferation of nuclear power plants, to name just a few. Resistance to sacrificing our newly found environmental "ethic" is strong -- organized citizen groups like the Sierra Club are fighting to see that it not be sacrificed to what they consider to be a wasteful and gluttonous rate of energy consumption.

In many quarters, there is an abiding faith that radically new technology will come to the rescue. Solar energy and thermo-nuclear fusion are often cast as the heroes -- both call up the siren song of virtually unlimited, pollution-free

energy. Unfortunately, these technologies have largely been neglected in the rush to expand our nuclear power capacity and to develop the breeder reactor (a scheme which increases the efficiency of uranium use by a factor of over one hundred). However, nuclear fission is fraught with environmental and safety problems which we are only beginning to appreciate, and several highly qualified scientists have spoken out against the whole breeder concept.

There is a fourth approach to the total supply/demand/environment dilemma now being pushed by most environmental groups, and it appears to be gaining recognition in parts of the federal bureaucracy, and to a lesser extent, in the energy industry. In its simplest form it means buying time by reducing waste -- an "energy conservation" philosophy. Reducing our consumption of energy could of course be accomplished by drastically reducing our material standard of living ("returning to caves and candles," as one industrialist puts it), but several recent engineering studies, plus the common sense observation that we live in a wasteful society, lead to the conclusion that there exist a variety of means for significantly reducing our rate of energy consumption, without compromising our material standard of living nor requiring radical changes in lifestyles. Barriers to the implementation of these measures are political, cultural, and economic, rather than technical. Not all of the proposals being put forth are feasible, or necessarily socially desirable, but many do appear to offer the possibility of reducing environmental

impacts while at the same time conserving fuels and enhancing the quality of our lives, and without the economically regressive effects of many pollution control measures. The following outlines some of the most significant areas where energy is being wasted.

### Transportation

The day-to-day fueling of motor vehicles, trains and airplanes consumes one-fourth of our annual energy budget, largely in the form of petroleum. If we include the manufacture and servicing of these carriers, the portion increases to between 30% and 40%. The manufacture and servicing of the automobile alone, plus the construction and maintenance of highways, consume fully one-fourth of our total energy budget. Thirty-nine percent of all the petroleum products burned in this country are consumed as gasoline in automobiles, and yet:

The internal-combustion automobile engine is so inefficient that three-fourths of the gasoline burned is wasted.

The average miles per gallon delivered has decreased since World War II from 13.5 mpg to 12.2 mpg.

Eighty-two percent of all commuters travel by automobile, with less than one-third of them carrying more than one passenger. The average urban passenger load during peak traffic hours is now only 1.2 people per car.

In cities, bus travel is more than twice as efficient (in terms of average energy expended per passenger-mile) as automobile travel. Commuting into a city by train is two and one-half times more efficient yet the number of revenue passengers on mass transit decreased by 48% between 1940 and 1971.

Shipping freight between urban areas by rail is four times as efficient (in terms of energy expended per ton-mile) as by truck; yet the percent of total tonnage shipped by rail has decreased steadily since 1950, while that shipped by truck has steadily increased.

Auto traffic in central cities moves at an average of about 12 miles per hour, the same speed achieved by horse-drawn carriages 100 years ago.

### Building Construction

The residential and commercial sectors of the economy together consume about 35% of our total energy budget, about half of that going to space heating and cooling. In 1970, 22% of all electric energy used by industry was consumed by the building construction industry, either directly in construction or indirectly through production of construction materials. Much of this energy is wasted, as the following facts show:

Construction standards for commercial and public buildings are often grossly excessive: some structural engineers have estimated that 50% of the material used in constructing large buildings could be safely eliminated if more man-hours could be put into framework.

Readily available design practices could reduce the amount of energy commonly used for space conditioning and lighting in most large buildings by close to 50%. (The New York World Trade Center has a peak electrical demand of 110 megawatts, more than that required by Schenectady, a city of 100,000 people.)

Twenty-four percent of all electrical energy goes for lighting, yet ordinary incandescent lamps convert only 5% of the electrical energy they consume into useful light; fluorescent lamps convert only 20%. Lighting intensity standards have more than tripled over the past two decades, and are no longer based upon either physiological nor psychological criteria.

Increased thermal insulation in homes and buildings could reduce energy consumption by as much as 40% and still save the owner money by reducing fuel and electricity consumption. Insulating beyond even the recently revised FHA insulation standards is still economical in most cases.

### Air Conditioning

In all-electric homes, air conditioning follows space and water heating as a major consumer of energy. Air conditioning is particularly significant as a power consumer because of its contribution to (or in some cases, its cause of) the seasonal peak power load that occurs in the summertime in many localities. Eighteen percent of the growth in residential electricity consumption between 1960 and 1970 was due to the growing popularity of air conditioning. Yet the efficiency of these systems, especially room units, varies widely:

Efficiencies of room air conditioners vary from 4.7 to 12.2 BTU of cooling capacity per watt-hour of electrical consumption. This means that the least efficient model consumes 2.6 times as much electricity as the most efficient one while accomplishing the same amount of cooling.

In 1970, the average efficiency for all room units was about 6 BTU per watt-hour. If the average efficiency had been 10 BTU per watt-hour, electricity consumed for air conditioning for that year would have been reduced by 15.8 billion kilowatt-hours, or 40%. That savings is the energy equivalent of 7.6 million tons of coal or the yield of approximately 1500 acres of strip mining.

The small increased cost of the more efficient models is more than compensated for by savings in operating costs. Even assuming the consumer buys his device on credit and pays an effective 18% annual interest rate, he would still be economically justified in paying up to \$79 more for a high-efficiency unit, assuming electric rates applicable to the Washington, D.C. area.

These are the most obvious areas where significant energy savings can be effected. There are many more, including the use of rejected heat from electric power generation, better design of heavy appliances, increasing the efficiency of many industrial processes, and utilizing the heating and recycling



potential of the mountains of solid waste we produce each year. The above list was chosen because the savings potentials in those areas are great, and because the means to achieve those savings are technically, if not politically, available now. In simple terms, here are some of the things that need to be done:

- Dramatically increase funding for public transportation systems in urban and suburban areas, possibly by diversion of funds from the Highway Trust Fund.
- Discourage single-passenger automobile commuters by such policies as discriminatory parking taxes and bridge tolls, and the reservation of express lanes for commuter buses.
- Place "environmental impact taxes" on the sale of high horsepower low-efficiency automobiles.
- Improve intercity rail networks and freight-handling procedures in order to create economic pressures to shift more intercity freight from trucks to railroads.
- Revise federal airline regulatory policies which in effect subsidize short inter-city air flights in order to shift more short-haul traffic to railroads and buses.
- Revise building codes to eliminate excessive construction and lighting standards.

- 8 -

- Develop standards for peak power demand and annual energy consumption for commercial buildings, and impose an impact tax on all buildings exceeding those standards.
- Tighten FHA insulation standards, and extend them to apply to multi-family dwellings and mobile homes.
- Pass state or federal standards setting minimum allowable air conditioner efficiencies, and require that all units be equipped with thermostats.
- Disallow the inclusion of promotional advertising as a legitimate operating expense for electric utilities, especially the advertising of electric resistive heating, in all areas of the country in which there is a shortage of low pollution fuels.
- Alter rate structures for electric power to place a premium on industrial power use during peak demand periods.

Successful implementation of all these policies might reduce total annual energy consumption by nearly one-third from that now being projected for the next decade. Resistance by special interest groups to many of these changes is of course extremely effective -- try telling the highway lobby to allow the Highway Trust Fund to be used for non-auto purposes, or the electric utilities that they shouldn't attempt to expand capacity, or the commuter that he can't drive to work any more. However, as the public becomes increasingly battered by the social and environmental costs of our profligate energy consumption, the

pressure for change increases. Cracks are already appearing in the old guard -- the fact that bitter controversy over highways vs. public transportation killed passage of the 1972 Federal Aid Highway Act by this Congress is highly significant. Of course the battle to open the Fund to public transportation has not been won, but, in an observer's words, "it is no longer a sacred cow... it will be broken." Economic pressures in other sectors are also beginning to work in favor of energy conservation. The current shortage of natural gas, for example, has prompted the Gas Technology Institute (the research arm of the gas industry) to study ways of increasing the efficiency of industrial processes which consume large quantities of their product. Savings achieved in that sector would yield more gas to sell to the residential market, where profits are higher.

Unfortunately, the regulatory agencies in the federal government seem reluctant to turn away from their traditional, promotional posture toward energy. Both the Department of the Interior and the Federal Power Commission remain firmly entrenched in the concept that continued growth in per capita consumption is the only responsible public policy. And that growth must be fueled by more energy of all forms, especially electricity. The idea of pursuing conservation policies like those outlined above with the same vigor with which we are now pursuing ways of increasing supply gets short shrift from Hollis Dole, Assistant Secretary of the Interior for Mineral Resources: "We shall have to conserve all the energy we can, but energy conservation

can never, by the remotest connection, be considered as an alternative to any measure designed to increase energy supply." (Emphasis added.) "Between now and the end of the century," says Dr. V.E. McKelvey, Director of the U.S. Geological Survey, "we will need to build a Second America in the sense that we have to duplicate the entire U.S. plant -- factories, homes, highways, and hard goods."

It would be naive to propose that total energy consumption could or should be strictly frozen at the present level. Some increase is inevitable. But do we have to double our total consumption in the next 28 years? (This is presumably what McKelvey means by his Second America.) What the federal regulators apparently have yet to grasp is that projections of past trends do not define the future -- hopefully, we have some control over our destiny. Energy consumption does not grow independent of public policy. The means being vigorously pursued by the Interior Department to avert threatened energy shortages include development of the breeder reactor, research into coal gasification, further development of offshore oil, and efforts to bring in oil from Alaska's North Slope. Little more than lip service is being paid to measures for demand reduction. In its recent proposed policy statement on "Conservation of Natural Resources," the Federal Power Commission says, "Overall, the Commission's basic purpose is to identify and articulate principles of prudent conduct which may be generally accepted on a voluntary basis in the further development of the Nation's primary energy resources, the conversion

of those resources into electric energy and public consumption thereof." As a result of this emphasis on supply, government projections of future demand have historically been excellent examples of self-fulfilling prophecies -- but the environmental impact brought to mind by a "Second America" can't help but make one skeptical about that pattern continuing much longer. (There are currently over 3.7 million miles of highways in the U.S. -- Do you want 7.4 million?)

### The New Sacred Cows

Arguments stressing conservation as opposed to promotion are often countered with meretricious arguments such as "Those who want to reduce growth want to keep that man in the ghetto in the ghetto" and "Here are 297 new ideas for cleaning up the environment -- all would require electricity to make them go." The electric power industry (the fastest growing major consumer of primary fuels) has been especially ambitious in exploiting new symbols of social consciousness. A promotional campaign being run by the Edison Electric Institute claims that large increases in generating capacity are needed to:

- implement recycling programs
- clean up pollution
- keep up with inevitable population growth
- increase the living standards of the poor

Officials at Interior and on the FPC, and even the Environmental Protection Agency, have responded as hoped to these statements -- one finds them mentioned in one form or another in a variety of recent government speeches. I find it quite disturbing that these arguments have apparently been accepted, at least tacitly, with little or no critical review. A few relevant studies have been carried out by public-spirited engineers in universities and research laboratories. Here are some of their conclusions.

- For steel, aluminum, copper, and paper the energy consumed in production from recycled scrap is considerably less than the energy required for production from raw ores. If just one half of the U.S. production of paper, steel and aluminum (common components of municipal trash) had been produced from recycled scrap in 1970, the overall electric energy savings would have been about 42 billion kilowatt-hours, 3% of the total electricity consumed that year.
- Currently, about 31% of our municipal sewage receives little or no treatment. Yet providing advanced secondary treatment for all domestic and industrial wastewater currently being produced would increase electric power consumption by only 1.3%.
- Over the last two decades, population growth accounted for only 18% of the increase in annual U.S. electricity consumption.

The electric energy required to provide 23 million poor people with the U.S. average annual residential electricity (220 kilowatt hours per person) would be only 3.6% of the total 1970 electrical consumption.

Any calculations of this type are necessarily very approximate, and we don't have enough experience with many types of environmental control systems, including recycling, to make more than very tentative estimates of their energy consumption. But, until the energy industries produce data to back up their claims, there is no justification for incorporating them into government policy.

Even a cursory study of energy consumption in America today reveals a great lack of prudence in the way we use our resources. This is not at all surprising, since energy has historically been cheap and abundant, and therefore there has been little motivation to use it efficiently. S. David Freeman, a prominent expert on energy matters, observes: "The past few decades can fairly be called a promotional era in energy growth. A variety of government policies have supported the promotional practices of the industry to make abundant supplies of energy available to Americans at the lowest possible price...[Yet now] the shortages of energy and abundance of pollution point up the need for conservation, but the market place is still responding to the policies of promotion. If the existing trend of accelerated growth in energy use is not turned off, then the existing projections may even understate the future rates of growth. But such a course of action is likely to place society on a collision course with itself."

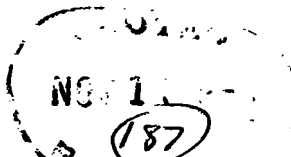
It appears that not only the market place, but also the federal government, is still operating from a promotional philosophy. Yes, Mr. Dole, we do need further, orderly development of new energy resources. But at the same time, we need to inject a strong dose of the old-fashioned conservation ethic -- i.e., husbandry of our precious natural resources. And this does not require great personal sacrifice, as some would have us believe, but only an elimination of the hidden waste that permeates our systems for energy conversion and use. In the long run, a vigorous pursuit of the energy conservation ethic might just buy us enough time to develop such clean, renewable energy sources as fusion and solar power, and even aid in our eventual transition to a less-polluted, less material, more human-oriented society.



LETTER NO. 34

The White House  
Washington

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7 INADEQUATE IMPACT STATEMENT ON OIL SHALE PROGRAM SHOULD BE  
8 RE-ANALYZED

9 MRS M C MARKHAM NATURALIST CAEWS ARBORETUM NEWARK OHIO

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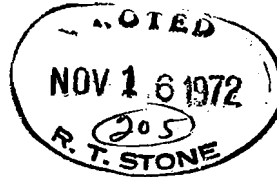
# DENVER AUDUBON SOCIETY

1742 Pearl Street

Denver, Colorado 80203

November 10, 1972

Mr. Reid T. Stone  
Oil Shale Coordinator  
Office of the Secretary  
Department of Interior  
Washington, D.C. 20240



Dear Mr. Stone:

Would it be possible for the Denver Audubon Society to receive six copies of the record of the public hearings in October concerning the draft impact statement for the oil shale program? Hopefully this request would not burden you. I feel that these documents would be put to better use than most paperwork put out by the Federal Government.

Denver Audubon also requests that Interior hold public hearings on the final impact statement for prototype oil shale. This may not be required by law, but I feel that it would be to our mutual interest. At the public hearings in Denver, Colorado, on October 10, 1972, you indicated to me that you felt the testimony gave rise to a necessity to clarify some of the points in the draft impact statement. Having sat through both days of hearings, I was impressed with the amount of testimony pointing out inadequacies in the draft statement. I feel that more is required than mere clarification. The recent case of Lathan v. Volpe (W.D. Wash., Aug. 4, 1972), involving the adequacy of a final impact statement for a superhighway in the State of Washington, discusses the burden on the agency. The case holds that the final environmental impact statement must respond to public comment on the draft statement. "The agency must give more than cursory consideration to the suggestions and comments of the public in the preparation of the final impact statement. The proper response to comments which are both relevant and reasonable is to either conduct research necessary to provide satisfactory answers or to refer to those places in the impact statement which provide them. If the final impact statement fails substantially to do so, it will not meet the minimum statutory requirements." Concerning research efforts during project operation, the court states that the National Environmental Policy Act "does not authorize defendants to meet their responsibilities by locking the barn door after the horses are stolen."

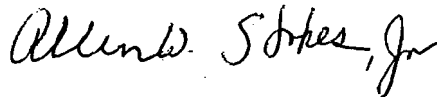
Thus, I think, based on the standards of Lathan v. Volpe and the extensive inadequacies of the draft statement as shown by the public hearings, that Interior must conduct field research and not merely have armchair biologists fill more pages for an even longer impact statement. A public hearing on the final impact statement would enable Interior and citizens to better determine if Interior had met the requirements of Lathan v. Volpe before leasing begins.

November 10, 1972

The final impact statement will hopefully be more complete and candid than was the draft statement. Additional environmental effects will supposedly come to light. Lack of a public hearing would enable the Department of the Interior to dismiss these detriments because they are outweighed by benefits from oil shale development without first receiving citizen opinion as to the significance of the increased environmental detriment. The National Environmental Policy Act requires that the agencies do a "detailed" environmental statement. Citizens should have a forum, other than the courts, to voice their opinions as to whether this requirement has been met. Citizens should have a chance to explain their views on oil shale to Interior. This is impossible to the fullest extent unless they are informed, a state which will come only after they have read the final impact statement and not merely the draft statement.

In the event that public hearings are scheduled, it would be necessary for environmental groups to receive the final statement, including a record of the public hearings on the draft impact statement, well before the hearings so as to enable us to prepare more responsible testimony.

Sincerely,



Allen W. Stokes, Jr.  
Oil Shale Workshop

AWS:mmm

# ENVIRONMENTAL POLICY CENTER

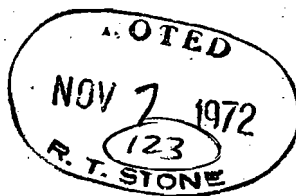
324 C Street, S.E., Washington, D.C. 20003  
(202) 547-6500

COMMENTS ON THE DEPARTMENT OF THE INTERIOR'S  
DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED  
PROTOTYPE OIL SHALE LEASING PROGRAM

SUBMITTED BY:

BRUCE C. DRIVER

*Bruce C. Driver*



Introduction: The comments are arranged in the following way:

I. An examination of some of the most important environmental effects of oil shale development as discussed, and not discussed, in the Draft Statement. II. An examination of the alternatives put forth in Volume II of the NEPA statement. III. A scan of the institutions, the lease, stipulations and regulations which control environmental damage.

We believe that the NEPA statement is a vast improvement over the initial draft statement submitted by the Department of the Interior in June 1971. However, in light of the failure to develop certain critical information regarding environmental effects and alternative energy policies, we have determined that the statement is inadequate. Furthermore, in light of the need to develop more information and to further assess alternative solutions to the problems presented by this country's reliance on imported oil, we believe that the Department should not issue oil shale leases at this time.

## I. Environmental Effects of oil shale development:

### a. Water.

One of the major inadequacies of the Draft Statement is its treatment of water supply problems. It is evident that there are three possible sources of water for oil shale development: surface water, ground water, and water from existing or hypothetical reservoirs.

Regarding surface water supplies, the Draft Statement ~~says~~ that there are 547,000, 279,000, and 162,000 acre feet of water available in Colorado, Utah, and Wyoming respectively after augmentation of the Colorado River and without changing designated present and future use categories. Vol. I, II-22. What is meant by "augmentation?" Does it entail weather modification, de-salinization or even defoliation of riverside vegetation? Whatever augmentation entails--the meaning of the word is never spelled out--there ought to be examination of the environmental impacts of an augmentation program. That these impacts could be very controversial if they are the result of a weather modification or defoliation program is clear. But to allege that because we do not know the extent or nature of augmentation programs at this point in time and that therefore, there is not much use in attempting to measure the impacts of an augmentation program is unsatisfactory. Environmental impacts of augmentation are secondary impacts, a kind of impact to which the Draft Statement gives short shrift in many instances. But it is these future and sometimes difficult to measure impacts which can accumulate to produce undesirable conditions to an extent far in excess of the impacts directly attributable to the original program or investment. We think that the Final Statement must spell out in greater detail what is envisioned by augmentation and what environmental impacts are entailed.

The suggestion that water will be available in the tri-state area from reservoirs some of which are not authorized gives us concern. Bureau of Reclamation water resource development projects are highly controversial acts of government in the Rocky Mountain states. One of the most controversial projects is the Yellow Jacket reservoir in Colorado, one of those reservoirs mentioned as supplying water for the oil shale industry, "when and if completed." Vol. I, II-72. Aside from the ecological problems raised by such projects, there remain the realities that the Bureau's role of supplier of water to industry must, in the law, remain incidental to agricultural purposes. It is difficult to see how there can be compliance with this law if even a small, if substantial, portion of the water resources made available from a project flows to oil shale development. Moreover, since only 30% of the appropriation for a project can be utilized to build capacity for future, anticipated needs, it is difficult to make oil shale development contingent upon future availability of reservoir water.\*

Groundwater supplies are a possible solution to the water supply problem. But because there are no data pertaining to the quality of these supplies for the six prototype sites, not to mention for the Piceance, Uinta, and Washakie Basins, the nature of these supplies is still hypothetical. The assumption that half of the groundwater to be encountered will be of high quality is not substantiated by any data. Even if the groundwater supplies do happen to be of high quality, there is the necessity that they be furnished at the correct time. This is another way of saying that the oil shale industry will need a stable source of water but that groundwater supplies, even if high quality, may be present at irregular intervals. A further unanswered question is to what extent will Basin

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\*We are very concerned that the channeling of 52 $\frac{1}{2}$ % of the royalties to the Bureau of Reclamation will amount to an indirect water resources subsidy to the oil shale industry.

wide supplies of groundwater be depleted by drainage of groundwater so that calculations of dependable groundwater supplies will be rendered inaccurate over the life of the development? And, finally, there are potential problems relating to the interaction of ground and surface water supplies, the depletion of one having an effect on the other. Nowhere in the Draft Statement are there data which satisfactorily handle these questions.

There is much discussion about the alternative means of supplying water to the oil shale industry. The Draft Statement suggests many ways in which "enough" water will be available. But this is not the question which is required to be answered in a NEPA statement. Rather, the law requires that the statement should attempt to measure the environmental impacts of the alternative means of furnishing "enough" water. Some information pertaining to environmental impact of water resource alternatives can be found in the statement, but it is scattered and needs to be pulled together in the Final Statement.

The Draft Statement does not discuss water used in revegetation, nor does it confront the problem of amount of water and its supply for in process needs. There are not sufficient data pertaining to urban effluents and their impact on ground and surface water quality. There is no mention of effluent problems caused by runoff from unburned sediment. And no mention is made of the opportunity costs associated with water used in oil shale development and therefore foreclosed for other agricultural, recreational and other usages. We advocate that greater attention be paid to these matters in the Final Statement.

That there are no binding salinity or other effluent standards for the Colorado River is only one example of the fact that there are no effective



water resource planning institutions in the oil shale region. We suggest, finally, that before a decision is made to proceed with a prototype program, every effort must be made to examine precisely where the water is going to come from, what the environmental impacts of water resource development will be and what planning is essential to the prevention of widespread damage to water and other resources affected by water resource development. This, we assert, the Draft Statement has not done.

b. Land:

In general, we believe that there remain important unsolved problems which should be answered before a decision is made to issue prototype leases.

We agree with others who have alleged that the Department of the Interior seems to have unwarrantedly extrapolated from the results of small lab or field tests in order to arrive at optimistic conclusions regarding the reclaimability of land stripped for oil shale and tailings left from the mining process. It appears that the TOSCO experiments have been made the basis of the Draft Statement conclusion that compaction would almost completely inhibit erosion. We submit that, in light of the results from U.S. Bureau of Mines tests indicating a permeability of residue of 10 times that of the TOSCO residue, that such a conclusion is unmerited. It is becoming increasingly clear that not enough is known regarding permeability of spoils for the Department to be optimistic that erosion will not occur to any great extent on the six prototype lease tracts. And although we agree in principle that there are some aspects of the prototype program which just cannot be studied any more, we believe that residue permeability is not one of them. Nor is the revegetative capability of spoils. If compaction of residues will prevent erosion,

how will this compacted residue support vegetation? Compaction is held to be so thorough that dust will not be a problem. But if spoils are so compacted that dust is eliminated, then the soil may be too dense to allow revegetation.

There remain unanswered questions regarding the reclaimability of tailings colored black by unburned residues. Revegetation of this type of spoil has not been sufficiently tested and although unburned residues may be the exception rather than the rule, we are not convinced that their existence will not cause problems insufficiently explained in the Draft Statement. How much time will it take to revegetate spoil banks or strip and open pit sites? Who will be responsible for assuring that if revegetation fails several times that attempts will not be dropped? Neither the sections on revegetation nor the lease and stipulations fully answer these questions. Before the Department issues leases, we should be presented with more information pertaining to the necessity of treating spoil banks for alkalinity and about problems arising from the necessity to store some tailings temporarily before placing them in mined out sites. Further, we would like to see more solid cost data regarding reclamation. We are not convinced that effective land reclamation is economical at this time and are unwilling to commit public land resources to widespread experiments which could, we believe, be obviated by smaller scale tests under varying conditions.

Areas already identified for development by surface mining methods include 75 square miles in the Washakie Basin. According to geologists more familiar with the regions than we are, these estimates of area to be surface-mined are based on incomplete study of rim deposits and seriously neglect the possibility of mining central portions of the oil shale deposit.

There has never been a satisfactory justification for choosing six tracts, two in each state, for the prototype program. Given the nature of the recovery process likely on the two Wyoming tracts, in situ, in light of the existing Bureau of Mines in situ demonstration operation, there simply is no need for the two Wyoming lease tracts. The only comprehensible explanation we have heard for the selection of the Wyoming tracts rests in political expediency, an explanation which is intolerable and inconsistent with the philosophy behind the Oil Shale Prototype Program. Furthermore, the two tracts selected in Colorado are in important mule deer range. Was this selection necessary?

Clearly there must be effective land use planning and control in the oil shale region in order to avoid the chaotic development characteristic of other mining areas in the West. The Draft Statement makes only passing reference to the planning and control institutions extant. We believe that the Draft Statement is deficient in setting forth the institutions which can prevent chaotic development. The fact that there are none in which we can repose confidence suggests to us that the prototype leases should not be issued until the proper institutions have been created and funded. We believe that the development of oil shale offers the federal and state governments an opportunity to start effective land use planning in an area unique in its land ownership patterns. The almost complete lack of this planning, for whatever reason, does not give us confidence that development can proceed without unwanted direct and secondary impacts. Some of the baseline data necessary for a response to the above questions will be developed by the \$750,000 Industry-Colorado-Interior Study. Summary results of this Study will not be known until the middle of 1973, at the earliest. We believe that to issue leases in the face of many

unknowns with the knowledge that the Study should provide much of the needed substantive data, is not in keeping with either the spirit or the letter of the National Environmental Policy Act.

c. The impact of a mature industry.

Although it is too early to know with any predictable accuracy the extent of an ultimate, or mature, oil shale industry, we believe that NEPA requires an examination of the environmental impacts possible from such an industry. Furthermore, we believe that NEPA requires study of the cumulative impacts of oil shale development, including cumulative secondary impacts such as the long-term effect of industrialization occurring as the result of oil shale development. We are not motivated by a desire to tie the Department of the Interior to useless analysis of distant hypothetical situations thereby slowing down the Department's leasing program; we are genuinely concerned that cumulative impacts and the impacts of a mature industry could be devastating to a degree not mirrored in the Draft Statement's Volume I analysis which is based on a one million Barrel Per Day industry. Our fear that decisions made now may lead inexorably to full-scale development, albeit in many years, is not mitigated by repeated assurances that before full-scale development will be permitted on the public lands, there will be supplementary environmental review. Political realities are such that all the supplementary review in the world may not stop full-scale development. And even if development is arrested on public lands, much damage can be done on private lands, damage which could be traced to public land decisions made in 1972 because of technological and other spin-offs from the prototype program being implemented on private lands. We feel that, at the least, the Department should try to assess what the eventual impacts would be of a 3-5 million barrel per

day industry, an industry size which the Department puts forth as a possible ultimate order of magnitude.

The above review of the Draft Statement is not exhaustive but represents our analysis of what we deem to be the most glaring inadequacies of the Statement. In general, we feel that there are other inadequacies, such as insufficient generation of information regarding air pollution and the failure to more closely examine the option of flood plain zoning. In general, the Department seems to have attempted to do a thorough job regarding compilation of an environmental resource inventory.

## II. ENERGY ALTERNATIVES

Volume II of the Draft Statement is, perhaps, the most comprehensive examination to date in a NEPA statement of energy alternatives by the Department of the Interior.

We feel, however, that the examination in Volume II is only a beginning of the work that must be done in the difficult field of alternatives analysis prior to a decision on the fundamental question whether or not to lease. A decision to lease public resources based on a determination of the need for the oil shale resource, in turn based on the material in Volume II, would make a mockery of the mandate of the National Environmental Policy Act. In brief, Volume II raises many important questions, but gives answers to almost none of them.

Our criticism of Volume II can be summarized as follows:

- a. There is insufficient analysis of the potential for conservation of energy and its impact on component demand for petroleum.
- b. Analysis of alternatives is made under the confusing assumption that, whether or not oil from shale can be substituted for by one or a combination of alternative energy sources, the amount for which substitution will be necessary by 1985 is one million barrels per day.
- c. Examination of combinations of alternatives is superficial in comparison with examination of alternatives made under the assumption that the alternative will have to take the place of all or a substantial part of supplies theoretically available from oil shale by 1985.
- d. Analysis of some energy alternatives, notably solar power, wind power and liquid hydrogen fails to take into account technological developments which would cast a more promising light on these alternatives.

e. Analysis of conventional alternatives, in particular on-shore domestic oil production, brings out the fact that production of the energy resource is held down less by the existence of reserves than by economic, technological and legal considerations. There must be further analysis regarding the possibilities of development of these resources in light of current and expected economic conditions.

f. Volume II completely omits mention of the North Central Power Study and the Department of the Interior's plans for development of low sulphur coal reserves in the Northern Plains. There is insufficient examination of the interrelationship of the development of oil shale and natural gas by nuclear stimulation.

g. Analysis of the alternative of increased oil imports fails to discuss the differences in risk associated with supply dependence on different countries.

h. Analysis of other alternatives such as storage of oil, reducing the number of tracts for which bids will be taken, delaying leasing of public land is seriously deficient.

#### a. Conservation of Energy

We find that Volume II gives only superficial attention to the alternative of reducing demand for energy. The tone of the Department's orientation to this most important alternative is set on page 13, Volume II of the Draft Statement:

"However, science and technology can and probably will produce some revolutionary as well as evolutionary technological, environmental, and economic changes that could significantly alter energy supply and demand patterns. Such development cannot be forecast with reasonable assurance; therefore, only evolutionary developments considered as logical outgrowths of present trends and efforts were used."

In other words the Department recognizes the alternative of reduction in demand for energy, but is content to assume that we must be pessimistic about the likelihood of implementing most conservation measures. That political and economic realities lend some credence to the Department's bias, a bias reinforced by the Department's concept, expressed many times, that an "energy crisis" necessitates a developmental orientation towards conventional energy resources as a hedge against emergency in the future, does not excuse the Department from rigorous study of conservation of energy potential. We cannot see how a NEPA statement could be judged adequate or how the Department's prototype program could go forth in the absence of rigorous study of conservation potential.\*

Pages 68-73 of Volume II are the only pages devoted to analysis of reduction in demand for energy. (Pages 73-78 are addressed to the environmental effects of such reduction, an important topic but not part of the analysis of the potential of energy conservation.) In these six pages there is an attempt to integrate sources of material to which the Department usually does not make reference. And for this the Department is to be congratulated. However, six pages of discussion hardly does the subject justice.

Since the publication of the Draft Statement, the Office of Emergency Preparedness has issued its report entitled "The Potential for Energy Conservation". Much of the material contained in this report was available in

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\*It may be that conservation of energy measures have been factored into the Bureau of Mines Energy Forecast which appears in tabular form on page 12 of Volume II of the Draft Statement. Examination of the assumptions made by the Bureau in light of other published material relating to conservation of energy leads us to believe that acceptance of the Bureau's figures even as order of magnitude parameters is an inexcusable violation of the NEPA mandate pertaining to examination of alternatives.



many scattered sources prior to publication of the report. The Report performed the service of bringing elements of energy conservation together in one concise report. It is asserted that the Department had access to much of the data included in the OEP Report and that a discussion of these data should have appeared in the Draft Statement. However, since a discussion of the data did not appear in the Draft, it is essential that it does appear in the Final Statement.

The OEP Report raises many questions. On page ii of the Introductory "Abstract" the OEP Report says:

"This study suggests that energy conservation measures can reduce U.S. energy demand by 1980 by as much as the equivalent of 7.3 million b/d of oil (equal to about two-thirds projected oil imports for that year)."

Later, on page v of the "Summary," the report breaks down this oil equivalent amount by component.

"By 1980, all suggested measures could reduce demand by the equivalent of 2.4 million b/d in the residential/commercial sector, 2.3 million b/d in the transportation sector, and 2.6 million b/d in the industrial sector."

Clearly, not all of the demand conserved will be in the oil sector. But substantially all of the b/d savings in transportation and much in the residential/commercial and industrial sectors will eventuate in the form of oil. Hence, assuming for the moment with the Department that fuels are largely substitutable as a function of their gaseous, liquid or solid form, there is hope that demand for in excess of 5 million barrels per day can be obviated by the conservation of energy alternatives suggested in the OEP report. Of course, adoption of these energy conservation measures alone does not "solve" the problem of reliance on imports in that reliance will not have been reduced to levels approaching present day imports of

oil. However, in tandem with a re-thinking of the Nation's import policy and reliance on conventional and novel modes of energy production on a larger scale, the OEP Report suggestions may be a solution. At the very least, there is a need to study them before issuing leases to mine oil shale.

In the residential/commercial sector two of the more promising proposals to conserve energy are improved insulation requirements and total energy concept structures. Together with educational campaigns encouraging more efficient appliances and adoption of conservation practices in the home, upgraded construction standards, more efficient expenditure of R and D funds, and tax incentives to encourage the demolition of new buildings these proposals could save the Nation .2 quadrillion BTUs/year, 5.1 Quadrillion BTUs/year, and 15 Quadrillion BTUs/year over the short, mid, and long terms respectively. Some of the demand saved will not be in the form of oil. But enough could be in the form of oil or oil derivatives that there is much merit in further researching the efficacy of the proposals before we commence oil shale development. It is certainly only "good housekeeping" to examine these conservation measures before unleashing what may be an inevitable long term commitment of resources to oil shale development.

In the transportation sector mass transit, improved freight handling systems and new engines seem to us to be the most promising of the conservation proposals for the short, mid, and long terms. These and other measures detailed in the OEP Report could save the Nation 1.9 Quadrillion BTUs/year, 4.8 Quadrillion BTUs/year, and 8 Quadrillion BTUs/year over the short, mid, and long terms respectively. We do not agree with the

allegation of the Shell Oil Company in "The National Energy Position", February 1972, as cited in Volume II of the Draft Statement on page 71 that mass transit improvements will affect only intracity transport. In the short-term most mass transit improvement will be on an intracity scale. Mid and longer term investments can be of a more widely ranging nature. We would like to see the background data used for the statement on page 71 of Volume II that a doubling of the availability of mass transit over the next 15 years will reduce total automobile usage by 4% only. In that nearly all transportation fuel is derived from oil, the Department must examine more closely the conservation proposals relating to transportation elicited in the OEP Report.

The OEP Report mentions that until large amounts of capital are made available for investment in mass transit, the benefits promised in the Report will remain limited. OEP Report, page 41. That there are large amounts of capital potentially available for investment in mass transit facilities is unquestioned. The source of funds is the Highway Trust Fund. Unavailability of money from the Fund at the present cannot foreclose examination of mass transit potential in the near future, however, especially since attempts to open this Fund may be more successful in the 93rd Congress than in the 92nd.

Increases in the price of energy to industry as reflected in rate structures and energy use taxes appear to be the most useful of the number of conservation proposals put forth in the OEP Report for the industry sector. Savings from these and other proposals could amount to 1.9-3.5 Quadrillion BTUs/year in the short term, 4.5-6.4 Quadrillion BTUs/year in the mid-term, and 9-12 Quadrillion BTUs/year in the long term.

It is essential that the Department analyze conservation proposals as a function of expected component demand growth for petroleum over the short, mid, and long terms and that this analysis be completed before the Final Statement is published. U.S. petroleum demand by sector has been measured by the National Petroleum Council in a table which appears on page 32 of Volume II of the Draft Statement. Conveniently, these sector demand growth estimates are for years which coincide with the OEP Report's short, mid, and long term time periods. In making this analysis it is important to note that OEP suggestions do not entail excessively large capital investments beyond those already programmed and that short and mid-term estimates assume no advances in technology. Page 17, OEP Report.

On page 70, Volume II of the Draft Statement, the Department makes the point that alteration of population trends can have but "little significant effect on energy demand." The Department bases its conclusion on the apparent fact that only 1% of the four per cent annual growth in demand for energy is attributable to increased population. But 1% over 4% is 25%. A potential savings in growth due to extensive alteration of population trends is, then, 25%, or over 2.25 million barrels per day of oil by 1985, based on Table I, page 12, Volume II, Draft Statement. This amount can hardly be termed of little significance.

#### b. Assumptions of Analysis

In Volume II the Department assumes that alternatives to oil shale development must be analyzed under the assumption that an oil shale industry will be producing at or near one million barrels per day. Firstly, because of the economic, technological and environmental unknowns of oil shale development, it is misleading to analyze alternatives and com-

binations thereof under this assumption, thereon premising a conclusion that no alternative or combination thereof can realistically take the place of oil from shale. We believe that it is just as likely that technological and economic developments will allow further development of on-shore conventional oil resources or that solar power could be developed to supply energy needs to the extent suppliable from oil shale by 1985 than it is that oil shale technology will be sufficiently developed.

Our point is that oil shale technology is as futuristic and unpredictable as many of the technologies which the Department dismisses as unlikely substitutes for oil shale. This point should be clarified in the Final Draft. Secondly, the decision whether or not to lease has become confused with the viability of substitutes for oil shale development. It is probably untrue that, if the Department were not to lease the six tracts at this time, there would have to be substitutes for one million barrels per day in 1985. For, as the Department has stated many times, development of private oil shale resources will take place, perhaps to the tune of 400,000 barrels per day by 1985, regardless of the nature of the Department's decision on leasing in 1972 or 1973. The Draft Statement is supposed to address itself to environmental impacts of alternative policies. It is not an alternative policy of the Department that there be no oil shale development because the Department cannot stop development on private lands. Hence, to analyze alternatives to proposed Department action or inaction on the scale of one million barrels per day is to create a false situation, one which very likely could not arise as a result of Department policies. What should have been examined is the likely shortfall of production of oil from oil shale stemming from a decision not to lease. The amount of oil production affected is probably

between 300,000-600,000 barrels of oil per day, or the amount of oil to be produced from the six prototype tracts plus other public tracts and private development directly stimulated thereby. Analysis of alternatives under the one million barrel per day assumption is erroneous and an improper application of the mandate of the National Environmental Policy Act.

c. Combinations of alternatives

We think that the discussion of combinations of alternatives is at best superficial. It is only logical to believe that substitution of oil from oil shale could be found in a combination of supplies. This likelihood is admitted by the Department on page 202 of Volume II of the Draft Statement. Why then was there not more effort made to examine various combinations of alternatives? We do not take issue with the necessity to examine each alternative in a vacuum, as supplying all or most of the supply of oil from oil shale. Considerations of clarity mandated this treatment. But additional material sifting the various possibilities of combination surely are necessary in order to get closer to what an actual solution could be. We believe that anything less than a more thorough review of combinations of alternatives is a violation of the spirit of the National Environmental Policy Act.

d. Analysis of non-traditional technologies

Analysis in Volume II of the Draft Statement of non-traditional technologies is generally inadequate. For example the discussion of solar power options on pp. 197-198 includes no reference to the recent studies and technological improvements which raise the hope that solar power can supplement energy need for temperature regulation in the commercial and residential sector in the mid and long terms. The technology to construct so-called "solar houses" in which heating, ventilation and air-conditioning requirements are met by solar power harnessed in collectors and stored in

cells, exists now. Solar installations are in the nature of plumbing, not space age technology. The Rand Corporation estimates that 70% of the heating, ventilation and air conditioning needs of California can be met by solar power installations by the year 2000. Considerably less than 70% can be met by 1985, not because of technological constraints but because of economic conditions. Clearly, solar power will not have widespread application in areas in which there is extensive cloud cover. And solar power will not always displace demand for oil. Nevertheless, as a partial substitute and as a supplement to other sources of energy in the mid and long terms, solar power has tremendous importance, not the least hint of which is found in the Department's treatment of it in Volume II.

Examination of the liquid hydrogen alternative is also seriously deficient in facts and assumptions. The Department states that conversion costs would be "extremely large". Page 201, Volume II, Draft Statement. Does the Department mean the cost of retooling in Detroit, conversion of individual vehicles or conversion of gaseous hydrogen to liquid form? Costs of retooling or individual vehicle conversion are known to be unexpectedly low. Costs of the production of liquid hydrogen are currently higher than that of petroleum, as the analysis points out. There is hope that costs of liquid hydrogen production can be greatly lowered. Furthermore, the cost of petroleum and refinement do not include externalities inflicted on the environment. The Department states that liquid hydrogen is not a viable alternative in the 1980 time-frame. Page 201, Volume II, Draft Statement. What is the 1980 time-frame? In other parts of Volume II, the Department talks of a 1985 time-frame. Regardless of time-frame, it appears to us that there is hope of developing an economic

substitute in liquid hydrogen to petroleum products. We think that the Draft Statement fails to examine this alternative to the extent required by the National Environmental Policy Act.

In its analysis of the potential for windpower the Department discusses power to be obtained from large towers situated on hill or mountaintops. Windpower appears to be capable of being produced from towers situated on the Outer Continental Shelf or from smaller windmills. We think that the Department should examine these alternatives before deciding that windpower is not a substitute or supplement to energy produced from oil.

e. Analysis of conventional alternatives

1. On-shore oil

It is estimated that about 2.8 trillion barrels of crude petroleum occurred in place in on and off-shore areas of the United States. About 171 billion barrels off-shore and 246 billion barrels on-shore are estimated to be recoverable under current technological and economic conditions. Page 26, Volume II, Draft Statement. It is further estimated that an additional 50,000 wells would have to be drilled to obtain supplies of oil equal to those which could be furnished by oil shale "within the proposed time-frame." Page 110, Volume II, Draft Statement. (What time-frame is meant here? By 1985, by 1980, ultimately?) It is further pointed out on the same page that there were less than 30,000 wells drilled in 1970. We are told elsewhere that we must be prepared to confront further declines in drilling efforts due, primarily, to the lack of economic incentives. And it is impossible to tell how much could be gained from a program of subsidy, price increase, regulation, etc. in raising exploration and production levels on-shore because there simply is not proper information available.



The conclusion put forth ultimately is that we cannot depend on increased production from on-shore wells to substitute for production of oil from oil shale. We submit that such a conclusion is unacceptable, especially in light of the assertion on page 112 of the Draft that an increase in only one per cent in the average recovery of oil in place (425 billion barrels) would yield 4.25 billion barrels, or two million barrels per day for 12 years.

We believe that before the alternative of increased domestic, on-shore production is discounted, many questions have to be answered. Why are oil companies not investing more in domestic, on-shore exploratory and secondary recovery activities? Why does not the oil import quota function to stimulate domestic, on-shore activities? Is the foreign tax credit responsible for a substantial drain of capital which would ordinarily flow to on-shore recovery activities? It may be that a breakthrough in recovery technology cannot occur under present cost and price levels; at what levels would a breakthrough likely occur so that, as the Draft Statement says, the amount of undiscovered oil will prove to be larger than that amount of oil discovered from 1859 to date? What will be the impact of adding oil from oil shale to the market on price levels and in turn on levels of exploration and development? Given the technological difficulties and unproven economic feasibility of oil shale, should we not be investing capital in the further development of known technologies or their extension before we plunge into something unproven? What are the likely relative rates of return? Does not the answer to some of these questions depend on oil industry data to which the public has no access on principles of privilege? In the absence of these data upon which the Nation can make sound energy policy, why should the public grant access

to its resources, that is the public oil shale lands? At the very least the public should be given an answer to these questions in the Department's Final Statement.

Production of oil from naval petroleum reserves, especially that at Elk Hills in California, appears to be a partial substitution for oil from oil shale. An investment of \$150 million is said to increase the productive capacity to 350,000 barrels per day from the present 2000 barrels per day. Rate of return for this investment must be several times rate of return in oil shale development. Why is there not further consideration of this alternative?

## 2. Coal

The most salient inadequacy of the Department's analysis of the alternative of coal is the failure to examine the alternative of deep-mine low sulphur coal found both in the East and West. The Table on pp.23-24 lists by state the reserves of coal by sulphur content and by method of mining which are recoverable under present (1970) economic and technological conditions. The most important aspect of these data is the existence of deep-mine low sulphur reserves of coal near centers of electric power demand in the East.

These figures indicate that there is far more low sulphur coal in deposits which must be deep-mined in such states as West Virginia, Kentucky, Montana, Wyoming and Colorado, than strippable coal. This is coal which in large measure can be burned to produce electric power and as such can soak up part of the demand for oil for such purposes, which, according to the National Petroleum Council, is destined to nearly triple by 1985. Page 32, Volume II, Draft Statement. There are nearly 19 billion tons of low sulphur coal which must be deep-mined in the Eastern states and over 180

- Sources: 1. "Bituminous Coal and Lignite," a chapter from Mineral Facts and Problems 1970 edition, Bureau of Mines, 1970.
2. Sulphur Content of U. S. Coals, Bureau of Mines Information circular 8312, 1965.
3. The Reserves of Bituminous Coal and Lignite for Strip Mining in the U. S., Bureau of Mines Open File Report, 1970.
4. Coal Reserves of the United States, Jan. 1967, Paul Averitt, U. S. G. S. Bulletin, 1275.

Low sulphur\*deep mine and strippable reserves  
of  
bituminous coal and lignite  
recoverable under  
present economic and technological conditions  
prepared by Bruce C. Driver

State	Amount of re- coverable deep mine bituminous coal and lignite in <u>millions</u> of short tons	Amount of re- coverable low sulphur deep mine bitumin- ous coal and lignite in <u>mil- lions</u> of short tons	Amount of re- coverable strip- pable bituminous coal and lignite in <u>millions</u> of short tons	Amount of low sulphur recover- able strippable bituminous coal and lignite in <u>millions</u> of short tons
Alabama	3193	487	134	33
Alaska	32221	18715	4411	4411
Arkansas	546	60	174	28
Colorado	19804	19804	500	476
Georgia	5	5	0	0
Illinois	30132	143	3247	0
Indiana	7981	93	1096	0
Iowa	1879	0	180	0
Kansas	4323	0	375	0
Kentucky	13994	5001	1758	532

\*Less than one per cent

State	Amount of re- coverable <u>deep</u> mine bituminous coal and lignite in <u>millions of</u> short tons	Amount of re- coverable <u>low</u> sulphur <u>deep</u> mine bitumin- ous coal and lignite in <u>mil-</u> <u>lions of short</u> tons	Amount of re- coverable <u>strip-</u> pable bituminous coal and lignite in <u>millions of</u> short tons	Amount of low sulphur recover- able <u>strippable</u> bituminous coal and lignite in <u>millions of</u> short tons
Maryland	254	0	21	0
Michigan	51	0	1	0
Missouri	4974	0	1160	0
Montana	51707	47726	6897	6133
New Mexico	14560	12880	2474	2474
North Carolina	28	0	0	0
North Dakota	82354	78101	2075	1678
Ohio	9002	153	1033	0
Oklahoma	715	246	111	10
Oregon	21	4	0	0
Pennsylvania	16800	300	752	0
South Dakota	408	343	160	160
Tennessee	528	36	74	5
Texas	1336	0	Data not available -----	
Utah	7993	5528	150	6
Virginia	2332	1861	258	154
Washington	1421	1336	135	135
West Virginia	21480	10730	2118	1138
Wyoming	24665	16802	13971	13377
Others**	1176	1176	0	0
<b>TOTALS</b>	<b>355883</b>	<b>221530</b>	<b>43265</b>	<b>30750</b>

\*\*Arizona, California, Idaho, Nebraska, Nevada

billion tons of deep-mine low sulphur coal and lignite in Western states. In so far as 331 million tons of coal were burned to produce electric power in 1970, the alternative of deep-mine low-sulphur coal should be examined with more thoroughness than it has received in the Draft Statement.

f. Oil shale development and coal and natural gas reserve development in the Rocky Mountains and Northern Plains

It is clear to everybody who has been watching federal involvement in the development of Northern Plains coal reserves and concurrent electric generating capacity that Northern Plains coal development and oil shale development have much in common. The markets for the oil and coal coincide in many instances and will do so to a greater extent as coal gasification and liquifaction as well as oil gasification become a reality. Furthermore, as 70% of the oil shale resource is held in public ownership, in excess of 80% of the Powder River coal deposit is administered by the federal government. The investors in the resources are the same: the large horizontally integrated energy companies. Yet there is hardly a word about the North Central Power Study, the federal government's hypothetical plan to develop Northern Plains coal and electric generating capacity. Are these two resources and their energy producing potential not in the nature of alternatives for each other?

What is the effect of oil shale development on federal plans to stimulate natural gas recovery by nuclear explosion? Some have alleged that oil shale development will preclude in large measure expected benefits from natural gas recovery in the oil shale area. The interrelationship of the two energy resource recovery efforts is not explained in the Draft Statement.

g. Oil import quota

Gradual relaxation of the oil import quota system is inevitable. That such

relaxation need not be attended by proportional jeopardy of our national security is a fact to which the Draft Statement does not allude. For example, selective relaxation of the quota to import more oil from Canada and from other relatively secure sources can mitigate the national security effects associated with greater dependence on foreign supplies. In addition, although the suggestion is probably beyond the duty of the Department in the preparation of a NEPA statement, consideration should be given to the overtures of Saudi Arabia and those of other oil producing countries which may follow regarding investment in wholesale and retail facilities in the United States. Investment in the United States could have the effect of reducing the likelihood of interruption of supplies because of the economic incentives at work. Finally, we take note of the fact that failure to bring shale oil into production would raise dependence on imports to a range of from 33 to 41 per cent to a range of from 37 to 45 per cent in 1985. Page 85, Volume II, Draft Statement. A four per cent effect, while not negligible, is not overwhelming.

#### h. Analysis of other alternatives

##### 1. Storage of oil and shut-in capacity

We believe that further effort should be made in examining the environmental impacts, economic feasibility and timing of the alternatives of storage and shut-in capacity. These two alternatives appear to be tailored to the main justification for oil shale development: too great a dependence on imports of oil must be avoided. We think that the very little mention of storage and shut-in capacity in Volume II--there is not even separate treatment of these alternatives--does not do justice to the fundamental soundness of the concepts embodied in these alternatives. Particular attention should be paid to the option of development of shut-in

capacity on federal petroleum reserves, at least as a partial solution to reliance on imported oil.

2. Reduction of the number of tracts offered in the prototype program

In light of the obvious political justification for the nomination of the two Wyoming tracts and the duplication of effort in each type of mining technique envisioned for the prototype program, we advocate that the Department consider reduction in the number of tracts as an alternative. We cannot understand why this alternative was not considered in the Draft Statement in light of the increasing public interest in the number and nature of the six nominated tracts. This defect in the alternatives analysis should be remedied in the Final Statement.

3. Delaying development on public land

The argument is asserted in the Draft Statement that to delay the leasing of public lands will decrease the time within which environmental impact can be measured. The Department has often stated that one of the benefits of leasing now is avoidance of a crash program at a later date. We assert that the prototype program amounts to a crash program of sorts in that development will proceed under the program as fast as economic conditions in the oil industry will permit. In any case surely there is no danger in awaiting the very important answers to the questions asked in these comments before leasing commences.

### III. The lease, Stipulations and Regulations.

We believe that the lease, stipulations and regulations present an imposing, but confusing, array of mechanisms by which the Department of the Interior can exercise control over damage to the natural environment. Our comments are directed to some of the ways in which we foresee the lease etc. as being inadequate.

With respect to the lease we think, as we do regarding coal leases, that the 20 year period within which a lease cannot even be adjusted is too long. We are aware of the fact that the lease states that new regulations are to be binding on the lessee and that stipulations may be amended yearly. Nevertheless, we believe that the Department should have the flexibility to adjust lease terms as often as every five years. Regulations and stipulations do not reach royalty, bond, relinquishment and other important issues which are covered primarily in the lease. The Prototype Program is essentially experimental and as such the Department must be able to alter the terms of the experiment when and if it fails or is producing undesirable results. That changing the time period of adjustment may entail statutory amendment should not deter the Department from pursuit of this objective.

It is evident that regulations codified in 43 CFR 23 are to play a major role in controlling environmental damage. Given the controversy surrounding these regulations as reflected in the Government Accounting Office's report, "Improvements needed in Administration of Federal Coal Leasing Program", March 29, 1972 and the response to this report by the Department, we are concerned that there are weaknesses in the regulations which will prevent them from being effective instruments of control.



Weaknesses include lack of guidelines to field personnel and inability to prohibit or restrict mining operations except in cases in which "previous experience under similar conditions has shown that operations cannot feasibly be conducted to avoid (certain effects)." 43 CFR 23.5(d).

Before mining begins on the prototype tracts, there will not have been any "previous experience under similar conditions" on which to base a decision to restrict or prohibit. The Department should have, therefore, the right to restrict or prohibit without tying such action to prior conditions.

The feeling persists that jurisdictional disputes between BLM and the Geological Survey and lack of sufficient and well-trained personnel in the field, problems which have beset the Department's leasing programs in the past, are unresolved issues. Unless there are the proper personnel to make the technical examination required in 43 CFR 23 et. seq., we are not hopeful that the Department can exercise discretion in the acceptance of mining plans called for in Section (2)(i) of the lease. Page V-21, Volume III, Draft Statement.

Regarding the stipulations we commend the Department for the provision in Section I(B) of the stipulations requiring compliance with changing pollution control laws. We hope that this section will not be used as a means to avoid the installation of the best available technology on the grounds that such installation would be inflexible or would economically foreclose the installation of better technology later. As for Section I(C) we do not approve of the self-monitoring program enunciated. Obviously, there is a built-in incentive to do cursory work and to fail to file reports. We advocate that the Department perform the monitoring function.

In Section 4(B) of the stipulations, the lessee is required to submit a statement of those measures which he proposes to take in order to comply with the requirements of 30 CFR 231.4(b) at times at which the lessee's actions entail significant disturbance of fish and wildlife habitat. We are pleased to see that the Department has isolated this circumstance and has obliged the lessee to articulate the ways in which damage will be avoided. However, we believe that the lessee should not be permitted to proceed with his actions until the Mining Supervisor has granted him permission, instead of, as under the present section, allowing the lessee to proceed if no response has been received within a certain amount of time. The point is not that 60 days are not enough time for the Mining Supervisor to make a careful decision but that the Mining Supervisor should be required to confront the problem and to make a response. Otherwise, this provision may vanish into obscurity.

Section 11(L) of the stipulations presents some problems. Firstly, we do not understand the meaning of "quality" of native vegetation. "Quality" is not an ecological concept. Revegetation must be accomplished with respect to the kinds and relative extents of native vegetation existing on or near the mine site before mining. Secondly, we do not believe that the lessee should be able to choose to what use mined land will be put after mining or to what standard the site will be reclaimed. The oil shale lands of the Prototype Program are owned by the public, leased to industry for a period of time, after which the complete interest reverts to the public. Normal lease arrangements do not permit the lessee to make decisions about the nature of the leasehold after the term of the lease is over. Neither should the lease to mine oil shale. The public must be

allowed to exercise its right to require that lands be revegetated to a high standard in all cases except those in which the Department has chosen-- perhaps in consultation with the lessee-- an end-use for the lands which does not require such revegetation.

In Section 12, regarding Scenic Values, the words "where possible" at the beginning of (A) should be deleted. The burden of proof of capability to reclaim mined land must rest squarely on the lessee. Hence, any areas in which good reclamation techniques, such as those outlined in Sections 11 and 12, are not feasible should not be mined unless the lessee is prepared to forfeit his bond. "Where possible" provisions would allow the lessee to weasel out of satisfactory reclamation on lands that maybe should not have been mined whatsoever.

### CONCLUSION

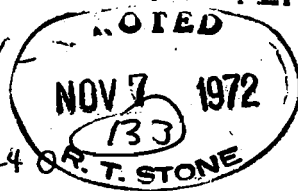
This nation undeniably faces many problems in meeting demand for energy over the next decade and beyond. And a large component of what is certain, at least in the short run, to be increasing demand will be for petroleum and petroleum products, the supply of which from domestic sources is not assured at this time because of economic and technological constraints. Does this mean that we must begin a program of oil shale resource leasing on the public lands at this time? We believe that the answer to this question is no.

Firstly, we feel that there are important environmental data which have not been generated to date or at least do not appear in the Draft Statement. Secondly, and more importantly, we believe that the Department of the Interior must have a better picture of alternatives to oil shale development, including conservation of energy measures, before a leasing decision is made. Although much useful information appears in Volume II of the Draft Statement, we feel that this information is simply not adequate to base a decision to lease at this time. In sum our concern for the diminishing natural environment has prompted us to be ever watchful of decisions made by government, whether federal, state or local in order to assure, to the best of our capabilities, that these decisions are demonstrated to be premised on the best data base possible and, in those cases in which a resource has been committed to be developed, are made only after it has been determined that there are no alternatives available. We do not believe that such a determination has been made in the case of oil shale.

Nov. 3, 1972

LETTER NO. 37

Secretary Rogers Morton  
Dept. of Interior  
Washington, D.C. 20240



Sir:

We consider the Interior Department's environmental impact statement on the oil shale program completely inadequate and request a more thorough statement which would at least consider carefully the destructive effects on wild life concerned. This program also makes excessive demands for water in areas where a water shortage already exists. Your careful consideration of this matter will be appreciated by all conservationists.

Yours truly,

(Mrs.) Patricia J. Lewis, Sec.  
Natchitoches Audubon Society  
1042 OMA ST.  
Natchitoches, La. 71457



## NATIONAL AUDUBON SOCIETY

950 THIRD AVENUE, NEW YORK, N.Y. 10022 (212) 832-3200 Cable: NATAUDUBON

REGISTERED MAIL

November 2, 1972

Mr. Reid T. Stone  
Oil Shale Coordinator  
Department of the Interior  
Room 7000  
Washington, D.C. 20240

Dear Mr. Stone:

Enclosed herewith are the comments of the National Audubon Society on the Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program.

We are grateful for the extension of time for comments to November 7, 1972. The extra days enabled our study team to prepare analyses and comments in more depth in an effort to be as helpful as possible to your office and to the Department of the Interior. Messrs. Knoder and Sumner made on-site inspections of the proposed leasing areas, as did others of various disciplines with whom they consulted.

We encourage you to study our comments and criticisms carefully and in detail, especially the conclusions. I am sending copies also to the attention of Secretary Morton and Assistant Secretary Reed.

Sincerely,

Elvis J. Stahr  
President

es

CC: Secretary Rogers C. B. Morton  
Assistant Secretary Nathaniel P. Reed



AMERICANS COMMITTED TO CONSERVATION

Comments of  
The National Audubon Society  
on the  
Proposed Prototype Oil Shale Leasing Program  
Draft Environmental Impact Statement  
of September 1972

Submitted by:

C. Eugene Knoder  
Associate Director  
Research Department

and

David Sumner  
Consultant

October 27, 1972

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## I. INTRODUCTION

The National Audubon Society has reviewed the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program (September 1972)<sup>1</sup>. We have paid special attention to those sections of the Statement dealing directly with, or relating to wildlife -- both terrestrial and aquatic. This is the Society's prime area of expertise and concern, and we find the Statement notably inadequate in attending to it.

In particular, we find that the Statement fails to comply with the National Environmental Policy Act (NEPA), specifically sections 102(2)(B), (C), (D), and (G). Furthermore, we also find that the Statement fails to comply with the intent of five federal laws and two international treaties, each of which calls for protective measure on behalf of wildlife.

The following six sections of this review (II - VII) detail the Statement's inadequacies in the areas listed below:

(1) failure to identify and develop methods and procedures which will ensure that presently unquantified environmental amenities and values are given appropriate consideration in decision-making, along with economic and technical considerations (NEPA, 102(2)(B)).

(2) failure to adequately assess environmental impact (NEPA, 102(2)(C)(i)).

(3) failure to adequately assess the relationship between local short-term uses of man's environment, and the maintenance and enhancement of long-term productivity (NEPA, 102(2)(C)(ii)).

(4) failure to study, develop and describe appropriate alternatives to recommended courses of action, despite the presence of unresolved conflicts concerning alternative uses of available resources (NEPA, 102(2)(D)).

(5) failure to give evidence in the statement that ecological information has been utilized in the planning of the prototype oil shale leasing program (NEPA, 102(2)(E)).

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1. U.S. Department of Interior, Proposed Prototype Oil Shale Leasing Program: Draft Environmental Statement (Sept. 1972). Hereafter cited as "The Statement," with page references as appropriate

(6) failure to follow the intent of the following:

(a) the Endangered Species Act of 1966 (P.L. 89-669, 80 Stat. as amended) which specified that the Secretary of Interior "shall seek to protect species of native fish and wildlife. . . that are threatened with extinction."

(b) The Bald Eagle Act of 1942 (54. Stat. 250, as amended) which declares that it is a federal policy to protect the national symbol.

(c) The Golden Eagle Act of 1962 (P.L. 87-884) which declares that it is national policy to protect this species.

(d) The Wild Horse and Burro Protection Act of 1971 (P.L. 92-194) which directs the Secretary of Interior to take jurisdiction over the "management and protection" of these species.

(e) the 1916 Convention between the United States and Great Britain for the protection of migratory birds.

(f) the 1937 Convention between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Mammals which specifies measures for the protection of these species.

(g) the Migratory Bird Treaty Act of 1918 (40 Stat. 755, as amended) which implements the Conventions mentioned in (e) and (f).

## II. UNQUANTIFIED ENVIRONMENTAL AMENITIES AND VALUES

As described in the Statement in general terms, the proposed prototype oil shale leasing program would have a major, though ill-defined adverse impact on the land, on its vegetative cover, and on wildlife in the three state region. A full scale industry would increase and intensify this impact.

However, the Statement fails to quantify the worth of the land, its vegetative cover, and its wildlife -- thus making it impossible to determine the environmental values to be "traded off" for oil shale development.

1. Fish and Wildlife. The statement notes that a substantial variety of wildlife species inhabit the specific proposed lease tracts, the areas surrounding these six tracts, and the larger oil shale area (11,000,000 acres) in the states of Colorado, Wyoming, and Utah. Some means of valuing these fish and wildlife populations must be established.

Take, for example, just one species and one oil shale area -- mule deer in Colorado's Piceance Creek Basin. A consumptive value can actually be (and has been) placed on these animals on the basis that each year they generate substantial recreational expenditures in the form of hunting and hunting-related dollars.

Furthermore, fish and wildlife also have a non-consumptive value to increasing numbers of people -- for aesthetic, cultural, historic, moral, ethical, evolutionary and scientific reasons. The prelude to the Bald Eagle Act of 1942 offers an excellent example of the historical and cultural value of a wildlife species.

Finally, each species of fish and wildlife is of worth in its own right -- a vital part of a coherent, diverse ecosystem -- regardless of man's interest therein. These environmental values must be quantified or otherwise evaluated for policy consideration.

2. Vegetative Cover. In addition to the consumptive value of certain native grass and browse species for livestock grazing, the vegetative cover of the oil shale lands also has a critical survival value as food and shelter for wildlife. The existence of a natural plant community is also of an increasingly recognized non-consumptive value -- and it is of ecological importance in its own right. These environmental values must be quantified.

3. Land. The Statement notes the land disturbances that will occur for mines, for plant and related building sites, for rights-of-way (roads, transmission lines, pipelines) and for disposal (overburden from strip mines, spent shale from retorting).

All of this constitutes a massive disruption of the natural landscape. In many places it means the eventual substitution of man-made contours for natural ones. The value of these losses or "trade offs" needs to be assessed from several points of view: loss of wildlife habitat, loss of natural diversity of landscape, loss of semi-wilderness.

For example, the Statement indicates that large quantities of spent shale from the prototype operations will be deposited in off-site canyons (anticipated for sites C-a; C-b; U-a; U-b). Further filling of canyons is inferred once a full-scale industry is under way.

What are the potential wildlife losses when a natural canyon is converted to an artificially contoured landfill? At its various elevations a canyon contains differing plant communities suitable to different wildlife species. The same is true of north and south facing slopes, also east and west. In many cases, the high walls shelter wildlife from the harsher elements. Often the varied topography includes ideal bedding, denning, and nesting sites critical to the existence of certain species in a given area. When any canyon is filled with spent shale, all these values to wildlife are irrevocably lost. While species may use the resources provided by canyons for limited portions of their life cycles, their survival may directly depend on access to these resources. Elimination of canyons can therefore have a destructive impact on the animal populations of a much wider area.

In addition, canyons are of non-consumptive (e.g., aesthetic) value. The value of all these potential losses needs to be carefully measured.

4. Water. The Statement notes that large quantities of water will probably be needed to support both the prototype program and a full-scale oil shale industry. It is assumed that this water will be drawn from the upper Colorado River system or, less likely, from ground water at the sites.

The upper Colorado River system supports a variety of aquatic and riparian ecosystems;

all upland systems are also dependent on these waters. Finally, the river system supports extensive recreation related to fish and wildlife. Any depletion or drawdown of the river system, either above or below the proposed development area, will inevitably lead to a diminishing of these environmental amenities and values.

Waste waters from retorting and mine dewatering are expected to contain substantial dissolved salts; as the Statement indicates, these low quality waters could readily leach or spill into the Colorado River system. Further, an increase in downriver salinity is expected anyway -- from the consumptive use of the Colorado and its tributaries by the oil shale industry and related development.

The value of these combined water losses -- both quality and quantity -- needs to be measured in the light of existing downstream commitments and the quality of Colorado environments.

### III. ENVIRONMENTAL IMPACT

The Statement details numerous unknowns and uncertainties which cloud the future of oil shale development -- both the proposed prototype leasing program and the projected full-scale industry. This uncertainty makes it extremely difficult to predict environmental impact with any confidence. For example, mining methods for each of the six lease sites are not specified in the Statement; only possibilities are entertained. Thus discussions of on-site disturbance and off-site disposal for the six leases are also conjectural.

However, even if the future course of development were clear, the Statement's assessment of potential impact would be inadequate, because it fails repeatedly to present even the most basic information on the environment of the oil shale region. Because of this broad deficiency, most discussions of impact are highly speculative, and sometimes either vague or missing, and are therefore inadequate.

1. Fish and Wildlife. Discussions of the impact of the proposed prototype oil shale leasing program on fish and wild-

life are inadequate in at least three specific respects:

(i) Quantitative data are lacking. Quantitative information on both fish and wildlife is inadequate in the Statement. To begin with, large segments of the wildlife communities in the oil shale region are completely ignored -- e.g., small mammals, amphibia, reptiles and invertebrates including insects. Thus there is no way of determining, from the Statement, the array of wildlife that actually lives on the lands in question.

Furthermore, when individual species are noted, quantification is often weak or lacking. With game species especially, kill figures are commonly used; but at best these statistics offer only a suggestion of the actual populations of resident wildlife and fish that may be affected by development.

The overall structure of the Statement is a progression from broad discussions of the oil shale region, to narrower discussions of the oil shale areas in each of the three states, and finally to specific discussions of the six individual lease tracts. As this sequence proceeds, discussion of specific impacts on the environment decrease until, in the discussion of the six lease tracts, only one quantitative statement is offered (re: Colorado Tract C-a: "possibly 10-20 wild horses," III.ii.30).

Sound quantitative information on wildlife and fish populations and densities is an essential starting point to any subsequent determinations of environmental impact. In the absence of such basic data, the Statement's discussion of "Impact on Fish and Wildlife" (III.iv.34-45) must be regarded as mere speculation.

(ii) Impact too narrowly defined. Generally speaking, discussions of impact on wildlife focus on actual land disturbance (i.e., habitat loss). This is true of the sections on both the oil shale areas in the three states, and on the six lease tracts. In truth, however, development will create a compound, ongoing complex of

disturbances in addition to actual habitat loss -- noise, dust, traffic, activity, structures, potential changes in both the quality and availability of water, and probable adverse changes in air quality. Mere people pressure in itself will also be a major disturbance; for example, it is expected that approximately 1,400 workers will be engaged in the construction of facilities at each site. In the sparsely populated Colorado oil shale region, this represents a major influx; the two largest towns in the area, Meeker and Rangely, now number only about 1,500 people each. The ~~total~~ combination of all these factors will create a pronounced "ripple effect" -- repelling many species of wildlife from an acreage well in excess of the physically disturbed land. Little effort is made to determine the extent of this larger zone of impact -- either around the individual lease sites or in the broader developed areas.

The case of Colorado's Piceance Basin -- White River mule deer herd deserves special attention; this is the largest migratory deer herd in the United States -- possibly the world. The presence of large zones of disturbance (an extensive "ripple effect") will divert large numbers of animals from their traditional travel routes. Tract C-a, for example, will, if developed, actually block one such route -- resulting in the displacement of an unstated number (but perhaps thousands) of animals. The impact of this and similar disruptions needs to be assessed, both in terms of potential wildlife loss and of habitat damage caused by excessive concentrations of diverted deer.

Similarly, an evaluation of impacts on all species of wildlife needs to be detailed for all six proposed lease sites in the three states. As the Statement now stands, there is no information which attempts to assess the inevitable decrease of wildlife populations.

(iii) Re-establishment of wildlife populations unclear. Discussions of wildlife impacts tend to treat the existence of the individual mining operations primarily as temporary disturbances -- with the promise that, after 20 or 30 years, the sites will be fully revegetated, and the attendant

implication that wildlife communities will come back more or less as before. Such a suggestion is based on at least five assumptions not supported in the Statement, namely: (a) that revegetation will occur, (b) that the revegetated cover will be of a kind and quantity that will support wildlife, (c) that sufficient "seed" populations of wildlife will somewhere and somehow sustain themselves for the duration of the industry, (d) that the springs and streams dried up during the mining operation will replenish, and furnish suitable water for wildlife, and (e) that, when a particular oil shale operation terminates, disturbance factors will return to their pre-development level.

In light of these factors, the re-establishment of wildlife populations (as anticipated by the Statement) must be adequately documented and made part of the permit system.

2. Vegetative Cover. The Statement gives substantial attention to plans for revegetating the spent shale. However, the discussion of this procedure and its ability to erase environmental impact remains inadequate on at least five critical counts.

(i). Revegetation experiments limited. To date, almost all revegetation experiments have taken place on intensively managed test plots only in Colorado. The extent to which these experiments may apply to more natural field conditions and to different environments in Utah and Wyoming must be determined since these other areas often involve very different vegetation types. Also, most experiments have been carried out on the residue from one retorting process (TOSCO); ability to revegetate spent shales from the various retort processes (i.e., shales of differing compositions) must be determined. In case the limited Colorado experiments do not apply, alternative plans must be formulated.

(ii). Relation between revegetated cover and wildlife not established. The Statement cites research on revegetating with six types of grasses (I.i.46).



However, only two of these species are native to the area. Attention needs to be given to the suitability and environmental impact of introducing foreign vegetative cover. On what basis were these grass types selected in the first place? To what extent are they capable of supporting various species of native wildlife? For example, will western mule deer feed on Kentucky Blue Grass? Is it suitable for them? Or are the tested species primarily of value as livestock forage? Information is needed on the ability of each grass type (and other reestablished browse and shelter species as well) to support a diverse and healthy native wildlife community.

(iii). Revegetated cover not tested under normal or extreme range conditions. No attention is given to the ability of the revegetated cover to withstand either normal or extreme natural range conditions. What will be the impact of normal grazing and browsing on the revegetated plant cover? Of overgrazing or overbrowsing? How well will the revegetated plant cover be able to withstand climatic extremes -- e.g., severe droughts or freezes?

(iv). Revegetation of diverse plant cover not established. Information on revegetating native plants other than grasses -- e.g., sage, pinyon, juniper, mountain mahogany, bitterbrush, serviceberry, and many other plant species -- is lacking. The Statement mentions transplanting some of the above but concludes with the assertion that reestablishment of the fuller range of native browse and cover species . . . "may be difficult and time consuming." (I.i.52). Further information on the practicability of revegetating adequate food and cover for a variety of wildlife is needed.

(v). Time required for revegetation not consistently explained. The Statement several times suggests that three years of intensive horticulture (watering, hand-care, and fertilizing) will be required to revegetate the surface of the spent shale. Historically, however, it has never been practical to revegetate a full spectrum of native growth in this semi-arid portion of the West.

And successful revegetation of native Western browse, shrub and tree species is known to require from 15 to 50 years before it becomes adequate wildlife feed and cover. These disparities need to be explained. Who is going to oversee revegetation after three years? Prospects and plans for maintaining wildlife populations during the interval of time between initial land disturbance and completed revegetation of habitat must be projected.

3. Land. The Statement is reasonably thorough in its discussion of actual land acreage disturbed on the lease sites of the prototype oil shale leasing program. However, it is notably deficient in discussing off-site impacts, or in carefully mapping impacts of a full-scale industry.

(i). Impact of off-site disturbance not discussed. Off-site disposal areas for spent shale, off-site storage areas for overburden, and off-site rights-of-way for roads, power lines, pipelines are all to be handled through special use permits from the Bureau of Land Management (BLM). They are not considered part of the lease proper, even though they are an absolutely integral part of any processing operation, and the inevitable impact from them will be a direct result of the prototype program. In effect, this segregation is a means of circumventing the maximum acreage provision (5,120 acres) for sites leased under the Minerals Leasing Act of 1920. Furthermore, the special use permits are procedural documents and not subject to citizen input so must be evaluated now.

Though development plans are not now finalized, the Statement's projections for both Colorado sites (C-a and C-b) and both Utah sites (U-a and U-b) point to substantial off-site disposal of spent shale, regardless of the mining method used (in-situ mining seems unlikely). Plans for site C-a, for example, presently call for disposal to take place approximately eight miles from the actual mine in a series of box canyons -- with an additional corridor for piped slurry between the locations. Although the statement describes these canyons as "dry", they actually contain

moisture at critical periods for wildlife during part of the year. According to the Statement, the acreage thus covered by the residue will be between 900 and 6,650 acres (III.iv.5), depending on the mining process used.

However, the Statement makes no effort to: a) describe the environment of these disposal sites, and b) detail the environmental impacts of their burial. Because box canyons are ecologically significant features of the western high plains country, often vital to wildlife, this omission must be remedied, and a complete accounting of the disposal impact made. Anything less would be inadequate.

In addition, the impact of off-site overburden storage (projected, for example, to 980 acres of yet another small canyon off Colorado site C-a) and other off-site land disturbances, needs to be documented and assessed.

Because the magnitude of each individual oil shale operation is so great and so complex -- involving at a minimum, at least, mines, roads, structures, living quarters, power lines, pipelines, disposal and storage sites -- separate assessments of the impact of each should be included in the Statement. It appears that an accurate, precise, and detailed evaluation of impact is possible for oil shale development only when this specific focus can balance broader discussions of area and regional impact.

(ii). Land-use planning inadequate for oil shale areas. Consideration of land-use patterns within the oil shale areas is omitted from the impact discussion of the projected full-scale industry.

To begin with, the eventual size of this industry is not prescribed and difficult to determine. Though a "mature" prototype industry is projected at a 1,000,000 bbl/day figure, no description is given of the physical extent of such an industry. No reasons are given for establishing this figure. Neither are there any indications of the eventual size of a full-scale industry, if and when it gets rolling.

In particular, it is extremely difficult to envision the density, or the distribution of operational facilities in the event of a "mature" prototype industry. Further plans for, and controls on, possible expansion to a full-scale industry are not included, and neither is there any indication of the size of the larger industry. One is left with the impression that all public shale-rich land in the three regions (Piceance Basin, Uinta Basin, Green River Basin) could eventually be wide open to development at any time -- raising the possibility not only of randomly scattered operations in the three regions, but also of dense clusters operating simultaneously on a number of adjacent tracts.

Therefore it seems vital to provide a master plan for land use on the shale bearing public lands. Such a plan should be developed both in terms of time and area/density scales, and particular attention should be given to assuring that substantial zones of viable wildlife habitat are continuously available during the industry's development and ongoing existence.

The Bureau of Land Management should have the opportunity to permanently withdraw from development certain BLM tracts critical to wildlife, in addition to the lands listed on PP. I.iv.2-3 of the Statement. Such areas should be chosen on the basis of their suitability as wildlife habitat, and could be designated as BLM Primitive, Natural, Geologic, etc. Areas as appropriate -- or perhaps designated as national wildlife refuges (e.g., the Piceance Basin National Deer Refuge). In Colorado, specific attention must also be given to the withdrawal of those lands whose surface rights are owned by the Colorado Division of Wildlife. Over 30,000 acres of such land exist in the Piceance Basin, most of it purchased with Pittman-Robinson funds, for deer winter range, in the 1940s and 1950s. As presently plotted, Colorado lease tract C-a includes approximately 680 such acres; furthermore, the most probable access route to this site will traverse more such acreage. If such master plan and withdrawal programs are not adopted, reasons for not so doing should be enumerated.

Finally, as many have suggested, this master plan should be dovetailed with larger regional (Rocky Mountain) and national land-use master plans. Interior will otherwise be open to the accusation of incremental rationality and of submitting our public lands to a tyranny of small decisions.

4. Water. Oil shale development, on both the prototype and full-scale levels, will require a large supply of water and also generate substantial waste waters. The impact of both water demand and disposal is not adequately explored in the Statement.

(i). Impact of increased water demand, and development, not discussed. It has been estimated that a "mature" prototype oil shale industry would require between 79,000 and 156,000 acre-feet annually; inadequate information in the Statement about the mining methods to be used makes it impossible to project more accurately. Much of this water (whatever quantity is used) will be drawn from undefined streams and rivers of the Upper Colorado River Basin, and will require the construction of substantial dam, diversion and piping systems.

To date, a number of water projects, both public and private, have been proposed to serve -- either exclusively or in part -- the oil shale industry. Among those mentioned in the statement are: Colorado--Yellow Jacket Project, Sweetbriar Reservoir, Rio Blanco Reservoir, West Divide Reclamation Project, and piping systems from the Colorado and/or White Rivers; Utah--a dam-diversion complex involving the White, Yampa and Green Rivers (I.ii.110); Wyoming--pumping and pipeline facilities from Fontenelle and/or Flaming Gorge Reservoirs. Planning for each of these pending projects has been initiated in large part because of anticipated future water demand by oil shale development.

This same anticipated demand is also the key to at least two possible water development projects not mentioned in the Statement: the Elk Creek Diversion Project and the Paradise Reservoir -- both in Colorado. Furthermore, the Statement does not mention that this same demand has also recently prompted a U.S. Senate decision to exclude 10,716 acres along

the South Fork of the White River from the proposed Flattops Wilderness in Colorado. This acreage would otherwise qualify for Wilderness and/or Wild River designation.

All these projects have been, at least in part, generated by the expectation of oil shale development. All represent a hidden expansion of that program and hidden costs. And all will have a notable effect on both fish and wildlife, as well as other environmental values. Yet despite the integral relation of these water projects to oil shale, and despite their substantial potential impacts, no consideration of them is offered in the Statement. Until the potential impact of these supporting water projects is assessed, the Statement is inadequate.

(ii). Management of waste water, and downstream impact inadequately discussed. The Statement details numerous measures that will be taken to prevent the leaching and/or drainage of waste waters into the Colorado River system. However, substantial areas of insufficient information exist in the Statement which make it difficult or impossible to assess the impact of waste waters.

For example, limited understanding of the ground waters in all three regions makes it difficult to predict the effect of pumping slurried spent shale into emptied room-and-pillar mines. The impact of other deep disposal of other waste waters is also inadequately explained. Increased knowledge of the subsurface hydrology of the oil shale areas in each of the three states is necessary to remove this deficiency.

Again, for example, limited design information regarding the nature and structure of the retention dams above and below the spent shale dump sites fails to explain how runoff of saline water would be prevented. Along with information about the dams themselves, data on each of the specific disposal sites is needed. No details are given on the porosity of the soils beneath these small impoundments -- especially the extent to which these would be impervious to percolation and leaching. Furthermore, no information is given regarding the ongoing maintenance of these dams. Who,

for example, will be charged with caring for and repairing these structures? How long will this supervision be necessary?

Information on and answers to these questions relating to waste water disposal are particularly critical in light of their potential impacts on the salinity of the Colorado River -- not only at Hoover Dam (the Statement projects the impacts here), but also in Mexico. An international treaty and a recent commitment by President Nixon to President Echeverria mandate a decrease in the salinity of waters of the Colorado River. Furthermore, any degradation of the Colorado River could pose a real and potentially damaging threat to the entire aquatic and riparian biota of the lower river system; any potential impacts of this nature must be discussed in relation to the several species affected.

#### IV. SHORT-TERM USE vs. LONG-TERM PRODUCTIVITY

The estimated life of the prototype oil shale leasing program is 20 years (with provision for renewal); this constitutes a short-term use of the land. The duration of a full-scale industry is unknown. The impact of these operations, as nearly as can be determined from the Statement, will be extensive and enduring -- especially in regard to wildlife and wildlife habitat.

During both the initial development and continued life of the oil shale industry, wildlife will undergo repeated displacement as new operations begin and old ones are phased out. The massive and compound pressures of development will definitely lead to a reduction in the numbers of most species in the 11 million acre oil shale area. More animals will be shot, killed by vehicles and powerlines, starved because of overcrowding and barriers to migration. Many will simply leave the area, and some species will be completely eliminated. Habitat -- both the vegetative cover and the topography -- will be altered.

The exact impact of this disruption cannot be assessed at this time. But on the basis of three sets of data --

(a) known or obtainable quantitative data on wildlife populations, (b) available information on their habits, and (c) approximate projections of oil shale industry growth -- general predictions of wildlife loss can be made.

To these predictions should then be added information on other existing and proposed developments in the oil shale region -- nuclear gas stimulation; the mining of Dawsonite, nahcolite and coal; and others.

The combined impact of these multiple developments poses an even greater threat to fish and wildlife of the three state region than would oil shale development alone. It may be theoretically simpler to discuss oil shale impacts in a vacuum, setting aside the simultaneous or serial impacts of other existing and proposed developments. However, it is dangerously unrealistic to do so.

The present Statement makes no effort to determine the potential long-term loss of wildlife productivity on the public oil shale lands. Since wildlife is a renewable resource, such a loss must be calculated as it increases, year by year, over an extended period of time. This must be done before the Statement can be considered adequate.



## V. ALTERNATIVES TO PROPOSED PROGRAM

Numerous undiscussed alternatives exist to the proposed prototype oil shale leasing program as it now exists. The following are options of special significance; all could help to resolve existing conflicts regarding resource use.

### 1. Alternatives to leasing on Public Lands.

The merits of a joint government-industry prototype development program on private lands deserves in-depth consideration for the following reasons:

(i) The Statement does not adequately explain the need to commit the public lands to a premature venture that at this point will involve numerous environmental risks. Until sound environmental safeguards are developed, the alternative of mining private lands must be considered as a means of saving the public lands resource from potential "destruction by experiment."

(ii) The Statement does not show that the destruction of public lands for a single purpose, oil shale development, is in the public interest at this time.

(iii) The Statement does not present benefit-cost analyses, or cost sharing data. Thus, the costs to the government (i.e., the public) cannot be related to benefits to industry. Meaningful alternatives cannot be discussed without this basic information.

For example, the proposed oil shale lease contains provisions for "extraordinary environmental costs that may develop after lease issuance to be credited against royalty payments on oil that industry would otherwise pay the government. The Statement nowhere explains why the government should share in the costs of environmental protection, especially on the public lands. With such a huge potential economic return, the costs of environmental risk should presumably be borne by industry.

In essence, this proposal in the lease suggests that the public should make its land resource available to industry for the latter's development, help foot the bill for reclaiming this resource, and then turn around and pay for its products.

(iv) The Statement does not explain why the leasing of such vast and valuable tracts of public land, for a destructive, single use enterprise, should not be submitted to Congress for review and approval.

It does not explain why Congress is to be given no opportunity to define the public interest in modern terms--as opposed to those embodied in the archaic and obsolete General Mining Law of 1872 and/or the Minerals Leasing Act of 1920.

For example, the formula for allocating royalty payments under the Minerals Leasing Act of 1920 is 10% to the U.S. Treasury, 37 1/2% to the State of origin, and 52 1/2% to the Reclamation Fund. No reason is given for preventing the Administration and Congress from coming up with a new formula, one that would provide a proportion of the funds from royalty payments for environmental research and protection for the public lands.

(v) The Statement gives less than two pages (II.63-64) to the study, development and description of the alternative of "no development of public oil shale land." In this extremely brief and speculative discussion, no factual information is given on the potential benefits of such a policy-- e.g., ongoing wildlife productivity, preservation of semi-wilderness, continued high levels of recreational use. No quantification of these and other resource values, over an extended period of time, is given. In short, the alternative of "no development" is unequivocally cited, and its potential benefits are wholly neglected. This is clearly inadequate.

Evidence that the alternative of "no development" needs to be given strong consideration was recently provided by Dr. Theodore Ellis<sup>1</sup> as follows: "It is concluded that the economic prospects of shale oil are marginal at best. The proposed leasing program will not by itself significantly improve this outlook or accelerate oil shale development. With the present state of technical knowledge shale oil neither is nor appears capable of significantly contributing to 1980 or 1985 fuel requirements--the likely time span of the impending "energy crisis". As a result the argument for quick development of this predominantly publicly-owned resource, as an important part of the answer to the forecasted petroleum shortages, tends to lose its force. Consequently, the best strategy should consist of accelerated R&D efforts and keeping all relevant options open until the oil shale issues are better understood and future developments more clearly point to particular courses of action."

This is a sweeping, forceful argument for "no development" by an authoritative source and clearly calls for an in-depth response from the U.S.D.I. prior to leasing the public lands.

## 2. Need for national policies on land use and energy.

The merits of incorporating the proposed prototype oil shale leasing program into national energy and land use policies are not discussed. The alternative of delaying this leasing program until such policies (and also specific plans based on those policies) are formulated merits consideration. Such policies would enable a national weighing and balancing of priorities and alternatives for energy development and land use--as opposed to a piecemeal

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<sup>1</sup>Ellis, Theodore John. Sept. 1972. The potential role of oil shale in the U.S. energy mix: questions of development and policy formulation in an environmental age. Unpublished Ph.D. Dissertation. Department of Economics, Colorado State University, Fort Collins.

development, use and destruction of our resources.

3. Need for integrated regional impact study.

As described in the Statement, the proposed prototype oil shale leasing program will have impacts on the entire Colorado River Basin. This vast drainage is already subject to environmental pressures from a large number of government-sponsored developments from Wyoming south to Arizona and Mexico. More are foreseen and oil shale is but one of them.

Since all of these developments combine to exert an integrated complex of pressure on the Colorado River Basin environment, an integrated impact statement is very much in order. Such a statement should carefully weigh the impacts of all actual and potential resource development, and address itself to the resource-use conflicts that most certainly will arise. The Environmental Protection Agency has suggested such a course. If this is not done, reasons for failing to do so should be enumerated.

4. Need to await results of current research.

Four major research projects on environmental protection were initiated in Colorado in 1972; these will not be complete until 1974 (I. i.75). Similar projects for Wyoming and Utah have not even been contracted. Results of these projects are expected to yield data heretofore not available--e.g., full environmental inventories, further research on re-vegetation, and water resource management. The information developed in these projects will bear directly, and critically, on wildlife.

Reasons for proceeding with the lease program (i.e., offering and accepting bids for the six lease tracts) before this anticipated valuable information is received should be enumerated. The possibility that some of these data would materially affect, and possibly render inappropriate, certain provisions in the present leases must be considered.

## 5. Alternatives to six lease tracts.

Adverse environmental impact could be diminished by reducing the number of lease tracts. No adequate non-political rationale has been advanced for proposing two lease tracts in each of the three states. The alternative of reducing the number of lease tracts, and consequently minimizing adverse environmental impacts, must be considered and discussed. Also, the alternative of consolidating the lease tracts into a single physiographic region, possibly within one state, must be considered as a reasonable means of minimizing adverse environmental impact.

## 6. Need for accelerated research in other energy fields.

The alternative of requesting Congressional authorization for funds to promote "crash" research into alternative energy sources needs to be considered. The Statement suggests many such sources in need of research. The alternative of declaring a moratorium on actual oil shale development, while proceeding with greatly accelerated research into several energy sources, needs to be considered.

## 7. Alternative Lease Stipulations.

The Statement presents no alternative lease stipulations; this document is presented as if it were in final form. Two alternatives, especially, need to be considered; these would provide greater assurance of land restoration, and greater public access to decisions affecting activity on its lands. If these revisions are rejected, reasons for so doing should be enumerated.

(a) Stronger revegetation provisions. The lease stipulations (Section II (L)) are so vague and

discretionary that they do not assure even minimal revegetation of mined-over lands. The three general criteria (III. v. 70) must be replaced with specific standards. Criterion #2, the option which allows revegetation "to a condition consistent with the use to which the land will be put after the end of the surface disturbance" must be eliminated.

If, for example, future use of a lease tract were to consist of nuclear stimulation to fracture tight underground rock formations for natural gas production, then conceivably no revegetation would be required. Criteria for revegetating the land with plant species selected expressly to re-establish a coherent and diverse native ecosystem (which includes wildlife) must be established for all cases. A future wildlife heritage on reclaimed oil shale leases must be assured in the lease. These alternatives must replace the proposed lease stipulation, which leaves the choice of revegetation standards to the discretion of industry. If provisions for this are not included, reasons for their omission must be enumerated.

(b) Inclusion of the 1965 Freedom of Information Act. The 1965 Freedom of Information Act should be made a part of each lease in order to assure that all transactions between the lessor (Mining Supervisor) and lessee (industry) are accessible to the public. This is particularly necessary because of the sweeping discretionary authority granted the Mining Supervisor during the entire lease period. Recommendations made to the Mining Supervisor by environmental Bureaus within the Interior Department must also come under the Freedom of Information Act.

#### 8. Alternative Disposal Procedures.

The primarily off-site disposal of spent shale is one of the greatest potential resource drains of the prototype program. Not only will numerous

canyon lands be buried; in addition, both initial treatment of spent shale (to prevent dust) and eventual revegetation will require tremendous quantities of water. Yet the Statement closes discussion of this problem by saying, "It is assumed that most spent shale will be initially disposed of in box canyons" (I.i.40).

Alternatives should be considered at two levels: (a) utilization and (b) disposal. The Statement mentions no chemical engineering research into the possible constructive use of the spent shale; if even a partial use were discovered, the disposal problem would be proportionally alleviated. In the event that the spent shale is proven utterly useless, alternative disposal methods must be explored and discussed.

At the very least, the Statement should explain why funding for special environmental research in this area is not an integral, on-going part of this program.

#### VI. ECOLOGICAL INFORMATION

The Statement is almost completely devoid of substantive ecological information; this repeatedly renders its discussions of environmental impact partial, disconnected and misleading.

A popularized "axiom" of the science of ecology, "everything is connected to everything else," is largely neglected in: a) the basic conceptualizing behind the Statement, b) its structure, and c) its presentation. Nowhere is this more apparent than in the several discussions of the environmental impact on the now essentially wild 11 million acres of oil shale land.

Throughout Volumes I and III of the Statement, soils, plant life, water, fish, wildlife, topography and climate are treated as if they were discrete and usually unrelated entities--rather than as integrally related elements of coherent ecosystems. The inventory

approach, often used in the Statement's descriptions of the environment, is a useful tool--but not a sufficient end when one's goal is assessing impacts on a complex natural ecosystem.

Throughout the Statement basic rethinking is required--a rethinking that establishes at least the primary relations that exist in the ecosystems of the oil shale region. Among these relations are:

- 1) Food Chains. The entire "lower" end of the food chains are completely ignored throughout the Statement--insects and other invertebrates, amphibia, reptiles, many small mammals. Fundamental relationships, such as those between predator and prey, need to be defined. More attention also must be given to the relation between various plant species and the herbivores that depend on them.
- 2) Plant Succession. Discussion of the revegetation experiments on spent shale, particularly those aspects dealing with introduction of exotic plants such as Kentucky Bluegrass, completely ignore this vital temporal relationship.
- 3) Plant Communities. Discussion of the revegetation experiments indicate that, so far, most work has resulted in the creation of monocultures (see I.i. 49, Figure I-8). While these experiments are now only preliminary, ecological input is vital if a viable and diverse native plant cover is ever to be reestablished. Revegetation experiments with exotic plants appear to neglect the probable effects of creating new, non-native ecosystems.

Statements of environmental impact that are not developed in terms of these and other ecological relations can only be rudimentary and therefore inadequate. Evidence of the perception of such relations--let alone their vital importance--by the writers of the Statement is minimal.



In addition, substantial and significant ecological communities have been excluded entirely from the Statement--an omission that may in part be due to the failure to include ecological information. Two of these communities are:

(a) Riparian (or stream terrace) communities. Complex and delicate systems of trees, grasses and wildlife that will be affected by any adverse changes of water quality or quantity.

(b) Aquatic communities. Locally and perhaps downstream these communities could be destroyed or disrupted by such disturbances as roadbuilding, pipelines, pipeline breaks, etc.

These ecosystems, and potential impacts on them, must be discussed before the Statement can be considered adequate.

Finally ecological information is notably lacking in discussions of waste disposal. The disruptive effects of filling canyons simply are not mentioned at all in the Statement.

## VII. ENDANGERED AND THREATENED SPECIES.

The Statement is so vague and conflicting that it is difficult to determine exactly the identity or numbers of rare, endangered or threatened species of wildlife that may become extinct or further diminished by the proposed oil shale development. The inadequacy of the Statement is exemplified by the absence of any listing of these species. Scientific names are not used; common or vernacular names that are used in the report are sometimes difficult to reconcile.

The Statement completely ignores specific treatment of the impact of a "her prototype or "mature" oil shale development on rare or endangered wildlife.

The intent of the United States Congress to prevent the extinction of endangered wildlife is amply demonstrated by several acts of Congress, as well as by Executive action as follows:

i) The Convention between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Mammals (ratified in 1937 and amended by Presidential action in 1972) proclaims in the leading statement in Article I: "In order that the species may not be exterminated . . ."

ii) The preamble to The Bald Eagle Act (54. Stat. 250, as amended) eloquently states, "Whereas the Continental Congress in 1782 adopted the bald eagle as the national symbol; and Whereas the bald eagle thus became the symbolic representation of a new nation under a new government in a new world; and Whereas by that Act of Congress and by tradition and custom during the life of the Nation, the bald eagle is no longer a mere bird of biological interest but a symbol of the American ideals of freedom; and Whereas the bald eagle is now threatened with extinction: Therefore . . ."

iii) In 1962, the golden eagle was given legal protection by Congressional action (P.L. 87-884, 76 Stat.). The introduction to the bill read: "Whereas the population of the golden eagle has declined at such an alarming rate that it is now threatened with

extinction; and Whereas the golden eagle should be preserved . . ."

iv) The Endangered Species Act of 1966 (P.L. 89-669, 80 Stat.) definitively states: "It is further declared to be the policy of Congress that the Secretary of the Interior . . . shall seek to protect species of native fish and wildlife . . . that are threatened with extinction . . ." Further, "The Secretary of the Interior shall . . . carry out a program in the United States of conserving, protecting, restoring, and propagating selected species of native fish and wildlife that are threatened with extinction."

Taken in toto these separate actions are a clear mandate for public policies which will not only prevent the extinction of endangered species, but also allocate resources and take special actions designed to place these species in a favorable competitive position to contend for survival. The Statement completely fails to come to grips with the issues of rare, endangered, or threatened species in terms of clearly expressed public policy.

1. Aquatic Endangered Species. Endangered species of fish are known to occupy the proposed 11 million acre oil shale area and the presence of others is suspected. Included are the Colorado River squawfish (Ptychocheilus lucius), Humpback chub (Gila cypha), Pahrnagat bonytail (Gila robusta jordani), Humpback sucker (Xyrauchen teanus) and the Colorado cutthroat trout (Salmo clarki pleuriticus). However, the Statement itself notes that: "Little systematic investigation of the Colorado River Basin fishes has taken place since 1900, and the status of many species is not known. Existing information indicates that the region has retained a large number of native species unique to the area. Several of these may soon be classified as rare or endangered." (I.ii.25).

Further information is clearly needed to more precisely quantify the populations of the above listed species, and also to establish more exactly the present aquatic biota of the Colorado River system. Such work is a vital prerequisite to assessing environmental impacts.

According to the Statement, the salinity of the Colorado

River at Hoover Dam in Arizona could increase by 1.4 to 1.6 per cent as a result of the consumptive use of its waters by the proposed oil shale development (I.iii.39). Apparently, even higher increases in salinity could be expected because the Statement notes ". . . small, but yet unquantifiable, (emphasis added) effects on salinity could result from ground-water depletion, and from accidental release of poor quality water." Estimates of the consumptive use of water as a result of oil shale development, exclusive of quantities needed for revegetation of spent shale, range from 79,000 to 156,000 acre feet annually.

The impact of the increased salinity, and of the increased consumptive use of the headwaters of the Colorado River system on endangered species of fish is not assessed. Possible indirect adverse impacts of lowered water quantity and quality on the aquatic biota, and subsequent food chain effects on endangered species such as the Yuma Clapper Rail (Rallus longirostris yumanensis), the peregrine falcon (Falco peregrinus) and our national symbol, the bald eagle (Haliaeetus leucocephalus) are inadequately assessed. These species occupy niches at the upper trophic levels of the aquatic ecosystem; they depend on its integrity for survival.

2. Terrestrial Endangered Species. Several species of rare or threatened wildlife, each one a member of a terrestrial ecosystem, occupy the 11 million acre oil shale region. These include the prairie falcon (Falco mexicanus), the golden eagle (Aquila chrysaetos), the bald eagle (Haliaeetus leucocephalus) and the mountain lion (Felis concolor). The Statement notes, "Important eagle (bald and golden) nesting and roosting sites are present along the drainage escarpments" of Utah sites U-a and U-6 (III.ii.63). In addition, Colorado's Piceance Basin may well contain the heaviest concentration of active golden eagle nesting sites of any area in the entire state -- plus several prairie falcon nests. The White River along this Basin's northern border is a major bald eagle winter roosting area. All of these terrestrial species are of special interest because their range is limited largely to the public lands. Hence

their future welfare is inextricably bound to decisions regarding management of these lands. The Statement inadequately relates oil shale development on the public lands to adverse impacts on populations of these species.

The Statement fails even to consider much less to quantify the impact on a number of species of birds that are believed to be declining in numbers and therefore likely to become endangered within the affected areas or states should severe disturbance of habitats and/or increased human pressures occur. Among such species are the sage grouse, sharp-tailed grouse, marsh hawk, sharp-shinned hawk, Cooper's hawk, ferruginous hawk, prairie falcon, black-crowned night heron, turkey vulture, burrowing owl, loggerhead shrike, mountain bluebird, western bluebird, and Bewick's wren.

By special act of Congress in 1971 (P.L. 92-194) wild horses and burros were described as "an integral part of the natural system of the public lands," and "declared to be under the jurisdiction of the Secretary (of the Interior) for the purpose of management and protection." Wild horses are reportedly found on one of the proposed public land lease tracts in Colorado, site C-a (III.ii.31). A total of approximately 500 wild horses roam the oil shale areas of the three states; they constitute a significant natural resource. Despite the legislative mandate to the Secretary of the Interior to protect wild horses on the public lands, the Statement fails to include quantitative treatment of the impact of the proposed oil shale development on these populations. In addition, no alternatives for their management and protection are discussed.

3. Conclusion. Present federal legislation directing public agencies, and specifically the Secretary of the Interior, to ensure the protection of rare and endangered species is largely limited to the actions that he may take on the public lands. Similarly, over 70% of the prime oil shale deposits underlie the public lands.

However, the Statement fails to account for rare, endangered and threatened species on the oil rich public lands in the following respects:

(a) inventories of presently rare, endangered and threatened species are incomplete;

(b) no consideration is given to additional species that extensive development might push to rare, endangered or extinct status;

(c) impact on the species mentioned in (a) and (b) above is not discussed;

(d) meaningful alternatives for the management of the species mentioned in (a) and (b) above are not discussed;

(e) the proposed leases contain no specific provisions to ensure the perpetuation of the species mentioned in (a) and (b) above.

These are major omissions and must be corrected before the Statement can be considered adequate.

#### VIII. CONCLUSION

The National Audubon Society believes that the Statement is so inadequate that an entirely new version is in order -- one that holistically considers environmental values such as wildlife and vegetation from the very beginning, and places them on a par with economic and technological concerns. We do not believe that mere revision or "patching" of the current Statement can accomplish this end.

Specifically, the following must be incorporated into the Statement on the proposed prototype oil shale leasing program:

- (a) adequate quantification of environmental values and amenities;
- (b) adequate assessment of environmental impact;
- (c) adequate assessment of loss of long-term productivity on the oil shale lands;
- (d) reasonable alternatives to the proposed program;
- (e) basic ecological information.

Furthermore, concrete plans must be outlined to assure perpetuation of rare, endangered and threatened wildlife.

. . . . .

LETTER NO. 39

# Natural Resources Defense Council, Inc.

1710 N STREET, N. W.  
WASHINGTON, D. C. 20036  
202 783-5710

November 7, 1972

*New York Office*  
36 WEST 44TH STREET  
NEW YORK, N. Y. 10036  
212 986-8310

Mr. Reid Stone  
Oil Shale Coordinator  
Department of the Interior  
Washington, D. C. 20240

Dear Mr. Stone:

Enclosed are the comments of the Natural Resources Defense Council, the Sierra Club, and the National Wildlife Federation on the Department of the Interior's Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program (September 1972). We find that the draft statement does not satisfy the requirements of the National Environmental Policy Act (NEPA) in a number of respects as detailed in our comments. The most serious deficiency is the Department's failure to discuss in adequate detail the alternatives of leasing no tracts or fewer tracts. These are alternatives which seem to be consistent with the avowed purposes of the proposed program.

The deficiencies we find in the draft statement -- particularly the fact that the Department omits discussion of several reasonable alternatives and of material environmental impact information -- are so serious that we believe that the Department should prepare and circulate a revised draft environmental impact statement which will enable decisionmakers --



-2-

including the Secretary -- and the public to have  
before them sufficient data to assess the program.

Sincerely yours,

*Thomas B. Stoel, Jr.*

Thomas B. Stoel, Jr.

*Edward L. Strohbehn, Jr.*

Edward L. Strohbehn, Jr.

Enclosure

cc: Mr. John W. Larson  
Mr. Mitchell Melich  
Hon. Russell E. Train  
Mr. Timothy Atkeson



COMMENTS ON  
DEPARTMENT OF THE INTERIOR'S  
DRAFT ENVIRONMENTAL STATEMENT FOR THE  
PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM  
(SEPTEMBER 1972)

Submitted on Behalf Of:  
Natural Resources Defense  
Council  
Sierra Club  
National Wildlife Federation

Submitted by:  
Thomas B. Stoel, Jr.  
Edward L. Strohbehn, Jr.  
November 7, 1972

## I. INTRODUCTION

The Natural Resources Defense Council (NRDC) finds that the Department of the Interior's Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program (September 1972) (hereinafter cited as Draft Statement) and the decision-making process with respect to this proposed prototype oil shale leasing program do not satisfy the requirements of the National Environmental Policy Act (NEPA).<sup>1</sup>

In particular, the Department has failed to comply with NEPA by failing to discuss in adequate detail either (1) the alternative of leasing no public lands tracts at this time and relying (a) on other energy sources or (b) on oil shale technology developed on private lands; or (2) the alternative of leasing fewer tracts. This is the most serious deficiency of the Draft Statement. Other major instances of noncompliance with NEPA include the Department's failure: (1) to consider comments submitted on the initial draft statement of June 1971;<sup>2</sup> (2) to evaluate carefully the costs and benefits of the proposed action and its reasonable alternatives; (3) to propose

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<sup>1</sup>/ Act of Jan. 1, 1970, 83 Stat. 857, 42 U.S.C. §§ 4321-4347.

<sup>2</sup>/ Dept. of the Interior's Draft Environmental Statement on the Proposed Prototype Oil Shale Leasing Program (June 1971) [hereinafter cited as "1971 Draft Statement"].

an oil shale program consonant with its stated purposes; (4) to undertake a careful and comprehensive evaluation of the reasonable alternatives to the proposed prototype oil shale leasing program and their environmental impacts; (5) to evaluate adequately the potential environmental impacts of the proposed prototype oil shale leasing program; and (6) to prepare a lease form adequate to protect the environment.

The deficiencies in this Draft Statement are serious, particularly in light of the numerous comments received by the Department on its initial draft statement (including the comments at hearings held last year) which noted similar failings, and the considerable time which the Department has taken to prepare this Draft Statement. Thus, it is surprising to find that most of the material environmental impact information which NRDC noted as having been omitted from the 1971 Draft Statement is still not included in this Draft Statement and that the Department does not provide any reasons for omitting this information. Since this Draft Statement does not provide sufficient information about the proposed action and its reasonable alternatives to enable the reader to make an informed comparison, NRDC believes that the Department must prepare and circulate a new draft environmental statement which presents in detail the relevant information so that the public and decisionmakers -- including the

Secretary -- can have before them sufficient data to assess the program in comparison with its reasonable alternatives.<sup>3</sup>

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<sup>3/</sup> See Natural Resources Defense Council, Inc. v. Morton, 3 ERC 1623 (D.D.C. 1972). See also id., 3 ERC 1558, 1561 (D.C. Cir. 1972); Ely v. Velde, 451 F.2d 1130, 3 ERC 1280 (4th Cir. 1971); Ex. Ord. No. 11514, § 2(b), 35 Fed. Reg. 4247 (1970); CEQ Guidelines §§ 3, 6, 10, 36 Fed. Reg. 7724 (1971).

## II. LEASE NO TRACTS OR FEWER TRACTS

The principal deficiency of the Draft Statement is its inadequate discussion of the alternatives of leasing no tracts or fewer tracts. (3, IX-2; 2, 63-65)<sup>4</sup> This is a very serious violation of NEPA and must be remedied in the revised draft statement.

### A. Requirements of NEPA

Courts have consistently required strict compliance by federal agencies with the requirements of section 102 of NEPA,<sup>5</sup> which include the duty to provide detailed discussion of the environmental impacts of a proposed action and its reasonable alternatives<sup>6</sup> and to provide the information and analysis supporting the agency's decision.<sup>7</sup>

"[A federal agency] must not only observe the prescribed procedural requirements and actually take account of the factors specified, but it must also make a sufficiently detailed disclosure

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<sup>4/</sup> Page numbers refer to pages in the Draft Statement. The citation convention adopted is: first number refers to volume number; subsequent number(s) refer to the page within the volume.

<sup>5/</sup> 42 U.S.C. § 4332.

<sup>6/</sup> Natural Resources Defense Council, Inc. v. Morton, 3 ERC 1558 (D.C. Cir. 1972).

<sup>7/</sup> See, e.g., Calvert Cliffs' Coordinating Committee, Inc. v. AEC, 449 F.2d 1109, 2 ERC 1779 (D.C. Cir. 1971).

so that in the event of a later challenge to the agency's procedure, the courts will not be left to guess whether the requirements of NEPA . . . have been obeyed.

. . . To enable a court to ascertain whether there has been a genuine, not a perfunctory compliance with NEPA, the [federal agency] will be required to explicate fully its course of inquiry, its analysis and its reasoning."<sup>8</sup>

A principal purpose of the impact statement is to compile in one place environmental impact information about a proposed action and its reasonable alternatives in order to enable decisionmakers -- such as the Secretary, the President, and the Congress -- and the public to be fully aware of the consequences of undertaking the proposed action and to enable decisionmakers to make more environmentally responsible decisions.<sup>9</sup> Impact statements are also intended to provide evidence of the agency's decisionmaking process.<sup>10</sup>

#### B. Purpose of the Proposed Prototype Program.

According to the Draft Statement, the purposes of the proposed prototype oil shale leasing program are:

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<sup>8/</sup> Ely v. Velde, 451 F.2d 1130, 1138 (4th Cir. 1971) (emphasis added). See also Ex. Ord. No. 11514, § 2(b), 35 Fed. Reg. 4247 (1970), and CEQ Guidelines, §§ 3, 6, 10, 36 Fed. Reg. 7724 (1971).

<sup>9/</sup> See NRDC v. Morton, note 6, supra; S. Rep. No. 91-296, 91st Cong., 1st Sess. 5 (1969).

<sup>10/</sup> See, e.g., Ely v. Velde, note 8, supra, Calvert Cliffs' Coordinating Committee, Inc., note 7, supra.

"to provide a new source of energy for the Nation by stimulating the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment . . . ." (3, I-3),

The Draft Statement declares that "[a]dditional oil shale leasing would not be considered until development under the proposed program had been satisfactorily evaluated." (Id.)

And in the 1971 Draft Statement the Department stated that the prototype oil shale leasing program:

"seeks to establish a new cooperative effort between the private and public sectors to assess the complex relationship between the development of oil shale and environmental maintenance. By necessity, existing technology would be modified and new technology developed both for extracting the oil and for reducing the environmental impact."<sup>11</sup>

Thus, from the Department's perspective, the proposed prototype oil shale leasing program is an advanced research and development (R&D) effort which seeks to determine the feasibility of various oil shale processes under specified environmental constraints and the effectiveness of the constraints in assuring minimal environmental impacts. These two factors -- the R&D nature of the program and the goal of minimal environmental impact -- should govern decisionmaking with respect to the program.

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<sup>11</sup>/ 1971 Draft Statement, at I-1.

C. Lease No Tracts -- Regulate Private Development

Regarding the types of oil shale retorting processes which will be developed by the program, the Draft Statement does not state that the Department will require establishment of a particular processing method on a particular tract.

The Statement simply asserts:

"A preliminary plan for lease development by a prospective lessee would be incorporated in the terms of any lease offer submitted to the Department of the Interior." (3, I-10 to -11)<sup>12</sup>

It therefore seems likely that the Department will accept the highest qualified responsible bids and permit the lessee to determine the process to be utilized. Thus, in discussing the environmental impacts on one of the Colorado tracts the Statement states:

"The amount of on-site and accompanying off-site disturbance associated with this tract would depend upon the mining and processing system selected by industry . . . ."  
(3, IV-2 to -3) (emphasis added).

The proposed lease form applies equally to above-ground and in-situ processing as well as to underground and open-pit mining.

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<sup>12/</sup> See generally the discussion in sections III & IV of the Draft Statement.



Under this scheme, the Department would be concerned primarily with assuring minimal environmental impact, while the lessees determined which oil shale technologies would be developed. Oil shale development will probably occur on private lands, however, regardless of Department action under the proposed leasing program. Thus, with respect to oil shale technology development, there is little difference between leasing public lands without requiring use of a specific process and leaving development to occur on private lands. Therefore, minimal environmental impact seemingly would be assured by not leasing any tracts and regulating development on private lands.

This alternative is not discussed at all in volume III, the volume which specifically addresses the environmental impacts of the proposed prototype program. The discussion of the alternative of leasing no tracts in volume II, which addresses alternatives to a full-scale industry, is inadequate (see 2, 63-65). It consists of two pages, and is mainly devoted to justifying a decision to lease some tracts now on the ground that delay would result in a crash program whose environmental impacts would be greater than under the proposed program. It does not consider at all the alternative of regulating development on private lands through legislation

giving the Department authority to control development on private lands in a manner consistent with the environmental protection goals of the proposed program.

D. Lease No Tracts -- Develop  
Western Coal Reserves

Oil shale resources in the United States comprise approximately 600 billion barrels of oil in high-grade shales.<sup>13</sup>

(2, 53) Recovering "even a small fraction" of the resource would provide sufficient oil to meet the nation's demands "for many decades." (Id.) Recoverable coal resources in the northern great plains, principally in Montana and Wyoming, comprise approximately 440 billion short tons to a depth of 3000 feet.

(2, 134).<sup>14</sup> Since only 95 million short tons of coal per year are required to equal the 1 million b/d production rate projected for the oil shale industry (2, 135), recovery of a fraction of these coal resources could also meet the nation's energy needs for decades. In many uses, such as electric

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<sup>13/</sup> Another 1,200 billion barrels are contained in lower grade shales. (2, 53n.1)

<sup>14/</sup> A total of about 2,800 billion short tons of coal to a depth of 3,000 feet exist within the United States. (2, 133)

power generation, coal is a direct substitute for oil.<sup>15</sup> Additionally, processes to convert coal to gas and oil exist, some of which appear to be commercially feasible<sup>16</sup> (2, 156-158). The environmental and socio-economic effects of developing oil shale and coal are approximately equal (2, 135), although less coal than oil shale need be mined to produce an equivalent amount of oil "due to coal's much-higher hydrocarbon content."<sup>17</sup> The Department has prepared and offered for consideration one proposal for developing coal resources of the northern great plains: the North Central Power Study. Implementation has apparently been postponed, pending an extensive, three-or-four-year study which will explore the environmental, social, and economic consequences of developing these resources --

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15/ In 1969, of installed generating capacity in the United States 28.8% could burn only gas or oil, 28.6% could burn coal and either or both gas and oil, 40.8% could burn only coal. Federal Trade Commission, Economic Report: Interfuel Substitutability in the Electric Utility Sector of the U.S. Economy, Table 9, at 36 (Feb. 1972). The report notes that boilers can be converted from one fossil fuel to another, at 21-22, indicating, however, that "[c]onversion from coal to oil or gas is more practical since a coal furnace would be adequate for gas or oil firing." at 22n.10. Still, since only 1.8% of installed generating capacity in the United States in 1969 was nuclear, Table 9, at 36, the potential for substituting coal for gas is great.

16/ See the following publications of Dept. of Interior, Office of Coal Research: 1971 Annual Report; Final Environmental Statement on BI-GAS Coal Gasification Pilot Plant, Homer City, Pa.; Draft Environmental Statement on Proposed Process and Equipment Revisions to the Synthetic Fuels Process Pilot Plant, Cresap, W.Va.

17/ Oil & Gas Journal, October 16, 1972, at 16.

the Northern Great Plains Resource Program.<sup>18</sup> This program includes development of mine-mouth multiproduct coal utilization plants which will produce both gas and oil and utilize the waste char to produce power.<sup>19</sup> These facts suggest that it may be appropriate not to lease oil shale tracts and instead develop the coal resources of the Northern Great Plains. The Draft Statement does not even mention the North Central Power Study or the Northern Great Plains Resource Program

E. Lease No Tracts -- Delay Leasing  
Pending Completion of Current Studies

The Department does not discuss this alternative at all in volume III of the Draft Statement, the volume which specifically addresses the environmental impacts of the proposed prototype program. The discussion in volume II, which addresses alternatives to a full-scale industry, is inadequate. (2, 64-65). It consists of one page and dismisses the alternative on the ground that delay "could prove more harmful" because delay would necessitate a "crash development program." (Id.) The discussion of this alternative does not mention at all the combined Department of the Interior-State of Colorado-industry

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<sup>18/</sup> See Newsweek, October 9, 1972, at 80-82.

<sup>19/</sup> Hon. Hollis M. Dole, Asst. Sec. for Mineral Resources, speech Aug. 18, 1972, in Rapid City, S. Dakota.

studies costing about \$750,000 which have been commissioned to investigate the environmental effects of oil shale development and are expected to be completed by the spring of 1974,<sup>20</sup> although these studies are referred to elsewhere in the Draft Statement. (3, I-7).

No "actual operations" are expected for about three years after issuance of oil shale leases, until about January 1976. (3, I-11) Department officials have stated that results of these studies will be considered by the Department prior to permitting actual operations.<sup>21</sup> Thus, the Department must discuss in detail the alternative of delaying implementation of the proposed program pending completion of these studies, which are intended to have a substantial impact on the program and could produce data suggesting that the program not be implemented. Similarly, consideration must be given to delaying the sale pending completion of the extensive Northern Great Plains Resource Program studies which will analyze the environmental and socio-economic effects of developing coal

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20/ Dept. of the Interior Press Release, August 24, 1972.

21/ Oil Shale Conference at Conservation Foundation, 1755 Massachusetts Avenue, N.W., Washington, D. C. on October 5, 1972.

resources in the northern great plains area.<sup>22</sup>

F. Lease Fewer Tracts

Nothing in the Draft Statement indicates that the R&D and minimal environmental impact purposes of the program can be achieved only by leasing six or more tracts. Moreover, there are data in the Draft Statement which suggest that the decision to lease six tracts is inconsistent with these purposes, which seem to require leasing fewer tracts. The cursory four-sentence discussion of this alternative is clearly inadequate. (3, IX-2).

Regarding tract selection, the Draft Statement says only:

"Many factors were considered during the tract selection process, including ground water quantity and quality, shale thickness and grade[,] amount of overburden, associated minerals, existing land uses, and competitive interest in various tracts shown by nominating companies." (3, IX-1).

The cursory half-page discussion justifying the decision to select six tracts suggests that the principal factors governing the decision were interests in encouraging competition among private interests and technological diversity. (3, IX-2 to -3). Discussion with governmental officials involved in the program<sup>23</sup>

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<sup>22/</sup> See discussion in section IID, supra.

<sup>23/</sup> Conference at the Dept. of the Interior, chaired by Mr. Reid Stone, Sept. 26, 1972.

and the facts that the State of Wyoming nominated two of the three tracts nominated after the date for nominations had passed (3, II-1), that the oil shale resources in Wyoming are "relatively low grade" (3, IX-100), and that only very limited information is available about the oil shale resources of Wyoming (1, II-148) suggest that political factors were paramount in the selection of the Wyoming tracts. Elimination of these tracts from the proposed program would avoid all of the substantial environmental impacts in the State of Wyoming discussed in section IV of volume III of the Draft Statement.

According to the Draft Statement, another important factor which governed selection of the six tracts was their potential for "[s]urface (open-pit) mining; underground mining and in-situ recovery." (3, IX-2). The Draft Statement acknowledges that "in situ processing is in the experimental phase of development and there is no assurance that commercial technology can be developed." (3, III-26). (See also 1: I-33, -36, -66; III-17). The Statement notes that a "longer period of development time will be required before commercial level production might be shown to be feasible" (3, III-32), and states that in-situ oil shale technology is currently in a "nebulous status" (3, III-43). Although in-situ processing may cause less environmental destruction than the other methods proposed,

it will still cause substantial environmental harm, as noted in the Statement. A decision not to lease a tract for in-situ processing would probably eliminate the Wyoming tracts from consideration, since "[o]nly one technical option, in-situ recovery, has been considered for the extraction of shale oil from these tracts because of the nature of the shale resources available" (3, III-30), and might permit elimination of yet another tract, since only three principal above-ground retort processes are considered commercially feasible (1, I-9, -14 to -16).

The Statement does not provide data sufficient to determine whether development of "commercial oil shale technology" requires the use of open-pit or strip mining. The various documents which have been prepared by the Department do not indicate that open-pit mining of oil shale differs substantially from open-pit mining of coal, copper, or iron, for example, and one statement suggests that the technologies are similar. (1, I-10). The Draft Statement acknowledges that open-pit mining is more destructive of the environment than underground mining. (1, IV-7). Thus, a decision not to lease a tract for stripmining would substantially reduce the environmental impact of the proposed program by eliminating a mammoth pit and by avoiding the need for an additional land reclamation program



approximately 1.5 times greater than that required for an underground mine for a single plant.

The Draft Statement suggests that at most three different oil shale processes are reasonably close to commercial feasibility. Even assuming that each requires a full tract in order to demonstrate commercial feasibility, only three tracts would be required. An industry spokesman recently indicated that it is unnecessary to construct more than one plant to demonstrate commercial feasibility of a particular process.<sup>24</sup> Given the extensive governmental involvement in the program, it is not clear that permitting other companies to utilize similar processes will substantially increase the competitiveness of the program or the industry which may evolve. Moreover, the Department should consider and discuss in detail alternatives, such as patent and licensing requirements, which will ensure competitiveness in any industry which might be permitted to develop on federal lands, regardless of the number of participants in this advanced R&D program.

The foregoing further suggests that it may be unnecessary to provide any public lands for development of certain technologies because development is proceeding on private lands. The Department's avowed purpose to minimize

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<sup>24/</sup> Oil Shale Conference at the Conservation Foundation, 1755 Massachusetts Avenue, N.W., Washington, D.C., on Oct. 5, 1972.

environmental harm, and its NEPA obligation to do so, require it to acquire and include in the revised draft statement detailed information about what is occurring and is likely to occur during the proposed leasing program on private oil shale lands. The statement must discuss in detail the alternative of leasing fewer tracts and leaving some technologies to be developed on private lands, perhaps with federal regulation to protect the environment.

The Department also has not considered the alternative of constructing demonstration plants of commercial size on public lands tracts smaller than those proposed to be leased and possibly adjacent to one another. The Department dismissed the alternative of leasing smaller tracts for each proposed plant on the grounds that:

"this might compromise the technological developments which were being undertaken, and also could result in less than a full-scale assessment of any environmental problems which might arise." (3, IX-4).

No data are provided to support the first reason; the decision by the Atomic Energy Commission to build one, possibly two, liquid fast breeder reactor demonstration plants suggests that constructing a commercial-sized demonstration plant is a feasible method to prove a technology. The second reason is not only absurd, it is inconsistent with the purpose of the program

to minimize environmental impact. If an oil shale industry will cause severe environmental damage, there is no reason to cause such damage to its maximum extent in order to prove its severity. Finally, no data are presented to demonstrate that a commercial plant requires 5,120 acres to operate economically. This seems unlikely, since the 5,120 acre maximum tract size was established by law in 1920,<sup>25</sup> long before oil shale technology had been developed to the point of potential commercial feasibility. Moreover, the Department could decide to limit the amount of land leased in order to reduce environmental damage and subsidize the construction and operation of demonstration plants. This alternative too must be discussed in detail.

#### G. Conclusion

In sum, the Draft Statement's discussion of the alternatives of leasing no tracts or fewer tracts is seriously inadequate. Adequate consideration of these alternatives is particularly important because a decision to undertake any leasing program, or one of larger scale than necessary, will create momentum to develop a full-scale industry which may be impossible to halt. Industry and the federal government will

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<sup>25/</sup> Mineral Leasing Act of 1920, 41 Stat. 437.

have invested billions of dollars, thousands of people will have been employed and have established new homes, a substantial part of the environment will have been destroyed and patterns of land use established which will make it seem less harmful to expand the size of the industry. Thousands of other persons who provide goods and services to the oil shale industry will be dependent upon its continuation. Responsible decision-making therefore requires the most careful consideration of the alternatives of leasing no tracts or fewer tracts.

### III. DECISIONMAKING PROCEDURES

NRDC is particularly concerned about the Department's failure to comply with the decisionmaking process mandated by NEPA. The Department has not undertaken a careful assessment of the proposed action and its reasonable alternatives, and has not "us[ed] all practicable means, consistent with other essential considerations of national policy, to improve . . . Federal . . . programs . . . to the end that the Nation may -- . . . attain the widest range of beneficial uses of the environment without degradation . . . ."26 This constitutes a flagrant violation of NEPA, whose principal purpose is to affect the substance of federal agency decisionmaking.<sup>27</sup>

#### A. Failure to Consider Comments Submitted on Initial Draft Statement

NRDC submitted detailed comments on the Department's 1971 Draft Statement which focussed on the statement's major deficiencies. the Department considered NRDC's comments a "pertinent review or critique" (1, VIII-13). Yet most of the omissions of material information from the 1971 Draft

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<sup>26</sup>/ 42 U.S.C. § 4321(b).

<sup>27</sup>/ 42 U.S.C. §§ 4321 et seq., especially §§ 4321, 4331, 4332; S.Rpt. 91-296, 91st Cong., 1st Sess. (1969); Calvert Cliffs' Coordinating Committee, Inc. v. AEC, 449 F.2d 1109 (D.C. Cir. 1972); Natural Resources Defense Council, Inc. v. Morton, 3 ERC 1558 (D.C. Cir. 1972).

Statement which NRDC noted have not been remedied in this Draft Statement, nor has the Department provided any reasons for its decision not to discuss such matters in this Draft Statement. Instead, this Statement merely asserts:

"Because the scope of the effort has been greatly expanded, a detailed discussion of each review of the original statement is not presented below. Rather, each of the respondent [sic] will be provided a copy of the revised material and be invited to offer revised comments."  
(1, VIII-13 to -14).

This procedure makes a mockery of the Act, belittles the role of public participation in the NEPA process, and wastes substantial time and resources of both the government and the public. The 1971 Draft Statement was prepared, circulated for comment, and submitted to the public in accordance with the requirements of NEPA.<sup>28</sup> NEPA requires agencies to answer and respond to comments submitted by the public on environmental statements.<sup>29</sup> The Department's regulations

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<sup>28/</sup> 1971 Draft Statement, at i.

<sup>29/</sup> Lathan v. Volpe, 2 ELR 20545, 20547 (W.D. Wash. 1972):

"The public may also [in addition to public hearings] raise environmental questions by way of comment to the draft impact statement. Since the final impact statement must respond to these comments, as well as to the comments of government agencies, environmental harm which may have been overlooked by highway officials may be brought to their attention. For this reason, highway officials must give more than cursory consideration to the suggestions and comments of the public in the (cont.)

require it to respond to comments submitted on draft impact statements and explain why the Department did not or did not adopt recommendations offered.<sup>30</sup> Although the regulations require such responses to comments to appear in final statements, the provision was drafted in the expectation that a final statement would follow a draft. The regulation reflects a policy that the Department respond responsibly to public comments. When, as here, the Department determines that a draft statement is not adequate and, therefore, that it must prepare and circulate a new draft statement, common sense and

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29/ cont.

preparation of the final impact statement. The proper response to comments which are both relevant and reasonable is to either conduct the research necessary to provide satisfactory answers, or to refer to those places in the impact statement which provide them. If the final impact statement fails substantially to do so, it will not meet the minimal statutory requirements. A sufficiently detailed final impact statement, which appends the comments received on the draft impact statement, provides the court with an administrative record which is reviewable." (Footnote omitted.)

30/ Dept. of the Interior Manual, Part 516, ch. 2, § .6.D(2), 36 Fed.Reg. 19343, 19345 (1971). See also CEQ Memorandum, "Recommendations for Improving Agency NEPA Procedures," May 16, 1972, at 8.

the policies of NEPA and the Department's regulations require it to respond to comments on the initial draft statement. In these instances, it is likely that deficiencies identified by the comments resulted in the decision to prepare a new draft statement. The Department should state what action it took in response to the comments and its reasons, so that those who commented can determine if additional comments are necessary.

NRDC attaches its original comments to these comments and formally resubmits them to the Department. Since most of the material environmental impact information which NRDC noted as having been omitted from the initial statement is similarly omitted from this Draft Statement, and since few of NRDC's other recommendations were adopted even in part, NRDC's comments on the 1971 Draft Statement are relevant to this Draft Statement. NRDC expects the Department to give full consideration to NRDC's original comments and provide detailed reasons concerning its disposition of them. The Department must accord the same treatment to the other comments on the 1971 Draft Statement.

B. Failure to Evaluate Carefully  
Benefits and Risks of the Pro-  
posed Action and Its Alternatives

The Draft Statement provides no indication that the Department has made a careful "evaluation of the benefits of the proposed project in light of its environmental risks



and . . . . [a] comparison of the net balance for the proposed project with the environmental risks presented by alternative courses of action."<sup>31</sup> This is most forcefully demonstrated by the Department's inadequate discussion of the alternative of leasing no tracts or fewer tracts.<sup>32</sup> It is also shown by the Department's failure to discuss at all such reasonable alternatives as investment of the R&D funds involved in the proposed prototype oil shale leasing program in development of other energy resources. Several such alternatives are noted in NRDC's original comments. The failure to perform this careful evaluation is also underscored by the inadequate discussion of the alternative of increased development of coal resources.<sup>33</sup> Coal deposits in the northern great plains could meet our nation's energy needs for decades to come, as could oil shale, and the environmental impacts and socio-economic effects of recovering

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<sup>31</sup>/ Natural Resources Defense Council, Inc. v. Morton, 2 ERC 1558, 1561 (D.C. Cir. 1972) (footnote omitted). See Lathan v. Volpe, 2 ELR 20545, 20547 (W.D. Wash. 1972) (in finding an impact statement inadequate under NEPA the court stated: "Finally, there is no detailed comparison of the costs and benefits for each of the stated alternatives. These are statutory requirements; they must be met, and cannot be taken lightly.").

<sup>32</sup>/ See discussion in section II, supra.

<sup>33</sup>/ See discussion in Section IID, supra.

and utilizing both of these resources are "approximately equal." (2, 135). The Department has indicated its intention to develop these resources in a number of actions -- leasing of coal rights on federal lands; development of the North Central Power Study, now postponed pending completion of the Northern Great Plains Resource Program; preparation of plans to develop multi-product mine-mouth coal utilization plants. Yet the Department does not mention either the Study or the Program in this Draft Statement.

The Department's failure to perform the careful risk/benefit evaluation of its proposed action and the reasonable alternatives is further demonstrated by its failure to consider systematically the environmental impacts of the proposed action and the reasonable alternatives. Thus, in one case, the Draft Statement concludes that an alternative could not be developed "with a proper concern for efficient resource recovery and adequate protection of the marine environment within the 1972-85 time frame" (2, 109), while in other cases the Draft Statement provides no analysis of the relative viability of the alternative (e.g., increased development of coal (2, 133-161), increased nuclear energy development (2, 162-172)).

C. Failure To Propose A Program  
Consistent With Its Avowed  
Purposes

The avowed purposes of the proposed prototype oil shale leasing program are noted in section II, supra, as are the principal inconsistencies between the proposed program and these purposes. In addition, the proposed lease form conflicts with these purposes because it does not assure that minimal environmental impact will result from implementation of the proposed program. The principal deficiencies of the proposed lease form are discussed in detail in section VI, infra.

D. Conclusion

In sum, the Department has announced that the proposed prototype oil shale leasing program is premised on certain basic purposes and then has proposed to implement the program in a manner which conflicts with these very purposes. To meet the requirement of careful decisionmaking mandated by NEPA, the Department must define the purposes of the proposed program precisely, propose actions which are consistent with these purposes, determine the reasonable alternatives to the proposed program and actions, and discuss the environmental impacts of the proposed program and actions and the reasonable alternatives in detail. In reaching its decision, it must

make its proposal public, including the precise purposes of and reasons for adopting the proposed action, and take into account comments and other suggestions provided by the public. This Draft Statement evidences serious deficiencies in the Department's decisionmaking process which must be remedied prior to any decision to implement the proposed prototype oil shale leasing program.

#### IV. EVALUATION OF ALTERNATIVES

The Draft Statement fails to evaluate at all or in sufficient detail several reasonable alternatives to the proposed prototype oil shale leasing program and their environmental impacts. The necessity of considering in detail all reasonable alternatives to a proposed action and their environmental impacts prior to undertaking an action has been demonstrated above. Failure to discuss in detail the reasonable alternatives to a proposed action is a flagrant violation of NEPA.<sup>34</sup>

Alternatives to the proposed action which are not discussed at all in the Draft Statement include: (1) use the R&D funds involved in the prototype program for R&D directed towards other energy sources, several of which NRDC listed in its original comments; (2) obtain the 250,000 b/d of oil expected to be produced by the prototype oil shale industry by 1982 (2, 58) from other sources, several of which NRDC listed in its original comments; (3) enact environmental protection legislation and/or regulations

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<sup>34/</sup> See, e.g., *Natural Resources Defense Council, Inc. v. Morton*, 3 ERC 1473 (D.D.C. 1971), aff'd, 3 ERC 1558 (D.C. Cir. 1972), enforced, 3 ERC 1623 (D.D.C. 1972).

in addition to or rather than relying on lease provisions.

Alternatives to the proposed action which are inadequately discussed in the Draft Statement include: (1) increased production of coal; (2) reduction in the rate of growth of energy demand; (3) increased oil imports; (4) a combination of alternatives; (5) leasing no tracts or fewer tracts; and (6) delaying the leasing of any tracts.

The Draft Statement suggests by its omissions that the Department is not really considering the proposed action and its reasonable alternatives. Rather, it seems that the Department decided to promote the development of an oil shale industry and is going through the motions of complying in form with NEPA's procedural requirements. If the Department were seriously assessing the proposed program and considering alternatives, it would not have failed to discuss reasonable alternatives to the program and inadequately discussed others, particularly the alternatives of leasing no tracts or fewer tracts, as discussed in detail in section II, supra.

A. Alternatives Not Discussed At All

The Department's failure to discuss at all the alter-

natives noted above is of particular concern to NRDC since NRDC noted the relevance of these alternatives to the proposed prototype oil shale leasing program more than six months prior to the issuance of this Draft Statement. NRDC's discussion of the appropriateness of these alternatives to the proposed program appears in its comments on the 1971 Draft Statement which are attached. A few additional remarks are appropriate.

From the Department's perspective, the proposed action represents an investment in an experiment -- an advanced R&D expenditure. Officials of the Department have stated unequivocally that any decision to lease additional federal oil shale deposits depends upon an evaluation of the results of the proposed prototype program which includes determinations of environmental acceptability. (3, I-3). The federal R&D investment includes the costs of planning and administering as well as those of studying and monitoring the prototype program. These amounts must be determined and presented in the revised draft statement, and alternative R&D investments such as those noted in NRDC's original comments must be discussed in detail.

The program also represents a proposal to develop an energy source which will produce 250,000 b/d of oil by the end of 1981 (2, 58), which production can be expected to continue as long as it is profitable. In addition, within the time frame of the proposed program but independent of it, it is expected that 150,000 b/d of oil will be produced from privately owned oil shale resources. An important factor in determining whether any particular energy development program should be undertaken is its place in the national energy picture. For example, a particular R&D proposal which will also provide energy fuels in the short-term which are deemed important of themselves may be more worthy than an alternative proposal which cannot provide usable resources within the same time frame, assuming approximately equal environmental and socio-economic effects. If, however, reasonable alternative fuel sources exist in the short term, the net balance of environmental risks and benefits may shift in favor of the R&D proposal which cannot provide short-term supplies. It is therefore imperative that the Department consider other energy source alternatives to the proposed prototype oil shale leasing program.



The Department's failure to consider the alternative of proposing legislation and/or changing its regulations to ensure minimal environmental impacts is a very serious omission, as indicated in NRDC's comments on the 1971 Draft Statement. In the present Draft Statement, the Department indicates that existing legislation restricts its consideration of some alternatives, such as increasing the size of the leased tracts (3, IX-4). The Department also acknowledges the substantial role played by recent legislation in making development of an oil shale industry even marginally feasible; without the increased tax depletion allowance accorded oil shale in 1969, the Department's proposed prototype oil shale leasing program would probably be of no interest to industry as a potential commercial enterprise (2, 50). Moreover, it is unlikely that development of an oil shale industry on private lands would occur absent the increased depletion allowance. In order to determine whether the impact of existing legislation on energy fuels development is appropriate to our environmental and socio-economic needs, the Department should determine the economic costs and probable environmental impacts of each alternative absent government

subsidies, credits, and other direct incentives, and present this information in the revised draft statement.

B. Alternatives Discussed Inadequately

1. Increased Production of Coal. Many of the inadequacies in the Department's discussion of this alternative have been indicated in section II, supra. In sum, the Draft Statement omits to discuss the North Central Power Study, the Northern Great Plains Resources Program, and the possibility of multi-product mine-mouth coal utilization plants which would produce both oil and gas and use the waste char to produce power. Yet the Draft Statement acknowledges that the environmental and socio-economic effects of developing coal and oil shale are "approximately equal" (2, 135) and that "the expanded use of coal power generation could be a viable alternative to the use of less abundant fossil fuels (oil and gas, 2, 137). Both resources could meet the nation's demand for energy for many decades. Adequate discussion of this alternative must include the reasons for the apparent decision by the Department to promote simultaneous development of both coal and oil shale.

2. Reduction in the Rate of Growth of Demand for Energy.

The discussion of this alternative is not the compre-

hensive and detailed discussion which the alternative merits, as NRDC has emphasized in numerous comments submitted to the Department.<sup>35</sup> The federal government has finally published The Potential for Energy Conservation, a staff study by the Office of Emergency Preparedness -- almost three years after enactment of NEPA. That study begins by admitting that sufficient time to analyze the issue thoroughly was lacking.<sup>36</sup> An essential weakness of the OEP study and of the Department's discussion of the alternative in this Draft Statement is the failure to consider adoption of a national policy to reduce the rate of growth of energy demand. Both documents focus primarily on energy resource conservation measures, such as improving insulation in homes (but not offices), using more efficient air conditioners, and introducing more

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<sup>35/</sup> See, e.g., NRDC's comments on Bureau of Land Management's Draft Environmental Statement on the Proposed Outer Continental Shelf Oil and Gas Lease Sale Offshore Louisiana, on the Draft and Final Statements on the OCS Oil and Gas Lease Sale Offshore Eastern Louisiana, and on the Office of Coal Research's Draft Environmental Statement on Proposed Process and Equipment Revisions to the Synthetic Fuels Process Pilot Plant, Cresap, West Virginia.

<sup>36/</sup> Office of Emergency Preparedness, The Potential for Energy Conservation ii (October, 1972).

efficient industrial processes and equipment.<sup>37</sup> Detailed consideration must be given to such additional measures for reducing the rate of growth of energy demand as public education, taxes, effluent charges, and changes in utility rate structures.

As the OEP study admits, additional studies of this alternative are needed. It is essential that the Department undertake studies which consider short-, middle-, and long-term reductions in the rate of growth of energy demand. Quick initial studies should be made to compile available information and materials, describe the effects of reducing energy demand to the fullest extent possible under current knowledge, and define problems which should be subjected to more intensive study. More detailed studies should be commissioned which include original research and analysis, especially of longer-term problems. The social impacts of reducing energy demand should be investigated and efforts made to identify methods of reduction which distribute the burdens most equitably among members of our society.

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<sup>37/</sup> Id., at v; Draft Statement 68-78.

As noted above, various methods for implementing the policy must be analyzed. The Department should also work with other federal, state, and local agencies in developing a coordinated policy of reducing energy demand in the short term and in obtaining legislation necessary to enable government agencies to implement energy demand reduction methods suggested by the studies.

3. Increased Oil Imports. The discussion of the alternative of increasing oil imports is deficient in failing to consider the various methods by which imports could be increased, especially those which would not impair national security. For example, restrictions on oil imports from Canada or other secure sources could be removed. Development of underground and above-ground oil storage facilities, including "storing" oil in shut-in fields, could permit increased imports without risk to national security. These storage alternatives are especially important because their potential for increasing energy supplies is so great. The Cabinet Task Force on Oil Import Control in 1970 recommended that they be the subject of "intensive study."<sup>38</sup> Yet the federal govern-

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<sup>38/</sup> Report of the Cabinet Task Force on Oil Import Control ¶ 436 (1970).

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ment has refused to invest even the modest sums necessary for research to test their feasibility.

4. Combination of Alternatives. The discussion of combining alternatives to provide the energy available from a full-scale oil shale industry fails to consider relevant combinations. The discussion in the Draft Statement focuses only on two alternatives, neither of which represents a combination -- increased domestic oil and gas production and increased oil imports. The Draft Statement concludes that "for some time to come the basic alternative to the production of a million barrels of shale oil would be a million barrels of imported petroleum" (2, 206). The Department's narrow focus is apparently due to its determination that little substitutability of energy forms can occur "for some time to come." (Id.) The Statement, however, presents only terse generalizations and insufficient data about the substitutability of energy forms (2, 15-17) to substantiate this conclusion, although less than half of the demand for oil is for the transportation sector and the internal combustion engine. The Department does not mention the February 1972 Federal Trade Commission Economic Report: Interfuel Substitutability

in the Electric Utility Sector of the U.S. Economy, which indicates great potential for substitutability among oil, coal, and gas.<sup>39</sup>

Given the expected near-term development of commercial oil gasification processes, and possibly oil liquefaction processes, the abundance of coal in the nation, and the fact that only 400,000 b/d of oil shale oil will be produced in 1981 and 1 million b/d by 1985, one combination of alternatives which deserves consideration is accelerated development of oil gasification and liquefaction, increased production of coal, and meeting short-term oil demands by a modest change in the Oil Import Program or increased oil recovery onshore or offshore. Similarly, specific demand reduction alternatives which focus on the low levels of reduction required to offset expected oil shale production must be discussed in detail.

5. Lease No Tracts or Fewer Tracts. See the detailed discussion in section II, supra.

6. Delay Leasing Any Tracts. See discussion in section IIE, supra.

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<sup>39/</sup> See note 15, supra.

## V. ENVIRONMENTAL IMPACTS

In its comments on the 1971 Draft Statement NRDC noted some environmental impacts which were inadequately discussed; as indicated above, substantially all these deficiencies still exist in this Draft Statement. Other inadequacies in the discussion of environmental impacts are noted below. The Department must remedy them in a revised draft statement.

### A. Water Resources

The Department's analysis of water resources in the area is inadequate, particularly regarding the nature of the area's aquifers. (See 1: II-22, III-43). The Department does not provide data comparing the amount of water available from existing reservoirs (Green Mountain and Reudi) with those which would be available if the authorized West Divide Project is developed; does not indicate when the West Divide Project is expected to be completed; and does not estimate the water budget deficits if the West Divide Project were not developed and the aquifers produced unusable water. (See, e.g., 1, II-21 in Table 2). In determining that sufficient water exists in the Upper Colorado River Basin for a 1 million b/d industry, the



Department considers 112,400 to 67,300 acre-feet of water "committed [to] future use" to be available without stating what the competing future uses are. (Compare Table 2, at 1, II-21, with Table III-8, at 1, III-40). In calculating the water needs of the program, the Department does not consider the amount required for revegetation, though this may be substantial, particularly if long-term irrigation is required. Finally, the water requirements listed at page III-35 of volume I differ from those given for the 1 million b/d industry at page III-39, n.1 of volume I, assuming water requirements are proportional to industry size and population. Moreover, the Draft Statement does not contain data necessary to determine whether the water requirements of a full-scale industry will be proportional to, relatively greater than, or relatively less than those of a prototype industry. Nor is data provided about that relationship for other environmental impacts.<sup>40</sup> This is a critical deficiency which NRDC noted in its comments on the 1971 Draft Statement.

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<sup>40/</sup> The Draft Statement fails to discuss the environmental impacts of the potential 3-5 million b/d mature industry which may develop (1, III-2). The revised draft statement must remedy this deficiency by providing information about the relationship between environmental impact and industry size and the likely pattern of development of a full-scale mature industry.

### B. Land Use

The Department's analysis of land impacts focuses on those directly associated with mining and processing of oil shale. The Department estimates that the land area thus disturbed by a full-scale industry will be about 50,000 acres without backfill and 35,000 acres with backfill. (1, III-21). The land impact of utility rights of way will be substantial -- about 10,000 acres (1, III-21); so will that of urban development -- about 15,000 to 20,000 acres (1, III-21). There is almost no discussion of these impacts in the Draft Statement. It is contemplated that an airstrip will be constructed (3; IV-35; VI-6), but there is little discussion of its impacts. Similarly, the Statement indicates that a new community may develop but does not analyze its impacts. (3, IV-56). Finally, it is hard to believe that the Department seriously considers a benefit of the program to be creation of a "scenic vista" in the form of an open-pit mine. (1, III-66). Possibly, however, this explains the Department's decision to permit the Mining Supervisor to allow disposal of mine wastes elsewhere than in the open pit.

### C. Land Reclamation

Regarding the viability of the proposed reclamation

measures, the Department and industries involved still lack sufficient data to know whether the shale tailings will support revegetation without continued irrigation and fertilization, how long such care is required, and what types of cover will thrive. (3, IV-7, -11, -13, -52, V-65; 1: I-44, -50, V-10). The Department may permit lessees not to preserve native top soil removed during mining (3, IV-7, V-69), although such a requirement may be the most effective method for ensuring reclamation of the land; may allow disposal of processed shale elsewhere than in the open pit (3, IV-4, to -5, V-69, -73) or underground (V-23), although such disposal would reduce the amount of land that must be reclaimed as well as the possibility of subsidence and the problems associated with leaching. The Department must provide reasons to support its proposal to adopt these environmentally less protective measures.

#### D. Waste Disposal

Waste disposal is a serious problem to which the Draft Statement devotes considerable space. No consideration is given, however, to disposal of soda ash; although possibly a marketable product in the short-run, soda ash will be produced by a full-scale oil shale industry in

quantities almost five times the nation's projected demand. (1, I-32). Additionally, it is unclear whether production of alumina is a benefit, given the immense amounts of power required to convert it. (1, I-32). Thus, it too may become a waste product which must be disposed of.

## VI. THE LEASE AGREEMENT

The documents which define most precisely the proposed oil shale leasing program are the proposed lease form and its accompanying stipulations. Their requirements determine whether the Department will meet its stated objective of assuring that minimal environmental impacts occur on leased federal lands from oil shale industry operations. Many of the lease provisions and stipulations are inadequate for this task.

### A. The Lease Form

The stipulations accompanying the lease form detail the environmental protection measures which will be required of lessees. The lessee's obligation to observe these stipulations is contained in section II. (3, V-42). To insure that no misunderstandings occur and that the stipulations bind the lessee equally with applicable regulations and law, the lessee's obligation to meet requirements established in the stipulations should be incorporated in sections 2(k) and 5 (3, V-16 to -18, -26 to -32), the lease provisions which are specifically concerned with protection of the environment and which indicate the relevant regulations that the lessee must observe.

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The remedies provided by the lease form to ensure protection of the environment are inadequate. Compliance with all environmental protection criteria and controls established by applicable law, regulations, the lease form, and the stipulations is assured only by a \$500 per acre bond. (§ 5(e) [3, V-29 to -31]). NRDC's comments on the 1971 Draft Statement detail the inadequacy of a bond in this amount to meet potential land rehabilitation costs. Clearly \$500 is insufficient insurance against all potential environmental destruction which may result from oil shale industry operations. Section 8 establishes the remedies available in case of default or failure to comply with the lease provisions. (3, V-40 to -41). It basically provides that the Department may suspend operations only where authorized by applicable regulations and then only after the default has continued for thirty days and the Department has served written notice on the lessor. The Draft Statement and the lease form do not specify what are the "applicable regulations." In any event, the Department should not permit lessees to engage in environmentally destructive activities for thirty days before operations can be suspended. The Department should be able

to suspend operations summarily and immediately where necessary to protect the environment. On the other hand, section 3(e) provides that the Department can waive any breach of the lease's conditions. (3, V-24 to -25). No standards are established to govern the Department's exercise of discretion under this section; no mention is made of the official who has authority to waive (e.g., the Secretary, the Mining Supervisor); and no public notice is required of either the occurrence of a breach or the Department's intention to waive.

Two preventive measures established by the lease form to ensure achievement of the environmental protection goals of the program are inadequate. Prior to beginning operations, and at other times thereafter, lessees are required to file mining and development plans which, inter alia, provide for avoiding or minimizing damage to the environment. (§§ 2(k)(2), 2(r)(2), 5(c)(d), (e) [3: V-16 to -17, -21 to -22, -28 to -31]). The lease form does not require that these mining and development plans be reviewed by experts from other federal, state and local agencies prior to their approval or that these plans be made public and interested members of the public have an

opportunity to review and comment on them prior to their approval. Lessees are required to prepare reports under two regulatory provisions governing operations on public lands and pursuant to the lease (§§ 2(f)(2), 2(r)(3) [3, V-15, -22])). Reports are not required, however, regarding compliance with the environmental protection stipulations and other environmental protection provisions of the lease, nor are these reports required to be made public.

One lease provision may well be a disincentive to environmental protection. Section 2(c)(4)(iv) provides for a rebate of royalty payments when environmental protection requirements imposed after leasing cause greater costs. (3, V-10). This seems an unfair price for the public to pay to protect the public interest. Since there has been a constant evolution towards stricter environmental protection standards, the oil shale industry should be required to accept these risks, just as other industries do. Otherwise, the program will not fulfill its avowed purpose to test commercial feasibility of an oil shale industry. It is possible to argue that new standards established by law can be grounds for royalty



rebates, since rebates are permissible, for example, when compliance with environmental protection requirements "has engendered or will engender extraordinary costs (1) not within the contemplation of the parties on the effective date of such plan." In addition, the Secretary is given discretion to determine if a rebate is warranted by the circumstances, and its amount. It would be more consistent with the purposes of the prototype program if the royalty rebate provision were omitted entirely, so that lessees would understand that they are expected to bear the costs of stricter environmental protection standards, as does industry generally. If new laws impose unreasonable costs on existing industrial activities, Congress can provide for mitigation.

#### B. The Stipulations

Four aspects of the stipulations designed to prevent specific types of environmental destruction are inadequate. The stipulations permit degradation of water quality (§ 9, [3, V-63 to -65]), although the Department earlier committed itself to a nondegradation

standard.<sup>41</sup> The rehabilitation requirements are lenient in several respects. (§ 11 [3, V-65 to -70]). Some examples follow. Rehabilitation is required only "to the extent practicable," strongly suggesting that economic criteria will govern decisionmaking with respect to one of the most important environmental protection provisions of the lease form. (§ 11(A) [3, V-69 to -70]). The Mining Supervisor is allowed to permit lessees not to save topsoil from stripmined areas (§ 11(K) [3, V-69]), which would make land reclamation substantially more difficult. Revegetation with native cover is not required (§ 11(L) [3, V-70]), even though the proposed program is an R&D effort which may result in a decision not to develop an oil shale industry. The type of revegetation established is left to the discretion of the lessee within a

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<sup>41</sup>/ 1971 Draft Statement, at III-17: "Under the terms of the proposed prototype leasing program, the goal is to permit no degradation in the quality of the naturally occurring waters of the oil shale region." See statement of Secretary Morton announcing the Department's plans for the proposed prototype program on June 29, 1971: "The Department is irrevocably committed to the maintenance of the environmental integrity of the oil shale area. . . ." (emphasis added).

broad category of choices, including that of "a condition consistent with the use to which the land will be put after the end of surface disturbance." (Id.) The lessee could determine this use by his own activities on the land. The Department's belief that a benefit of open-pit mining is the creation of a "scenic vista" (1, III-66) provides little reassurance about what the Department might deem an appropriate "use to which the land will be put." The lease form does not establish specific land reclamation requirements (§ 11(J), [3, V-69]), although the Draft Statement devotes considerable space to discussing what are considered proper land reclamation techniques, including the degree of slope appropriate for protecting the environment (1, I-38 to -52). The lease form permits the use of "off-road vehicles in a manner consistent with applicable regulations" (§ 2(N), [3, V-54]), although the applicable regulations are not specified.<sup>42</sup> Finally, with respect to noise pollution the stipulations provide:

"In the absence of specific noise pollution standards, the Lessee shall keep noise at or below levels safe and acceptable for humans, as determined by the Mining Supervisor."  
(§ 10, [3, V-65]).

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<sup>42/</sup> The Department's Draft Environmental Impact Statement on off-road vehicle use was severely criticized in July 1972 comments by NRDC.

Of all possible approaches to minimizing noise pollution, this seems one of the least appropriate, particularly because the Mining Supervisor probably lacks expertise to determine "levels safe and acceptable for humans."

Three aspects of the stipulations which seek to prevent or to minimize environmental damage in a more general manner are inadequate. In section 1(B), the stipulations provide that they may be revised at any time by mutual consent of the Mining Supervisor and the Lessee "to adjust to changed conditions or to correct an oversight." (3, V-45). In addition, these two persons and the BLM District Manager will review advances in technology annually in order to determine if the stipulations should be revised. (3, V-45). The stipulations were established to assure minimal environmental impacts, and presumably were developed through consultation with experts in various disciplines and adopted only after the public was given an opportunity to review and comment. Changes in the stipulations should be made in similar fashion: experts in such fields as air pollution, water pollution, land reclamation, and oil shale technology should be consulted; proposed changes should be made public and members of the

public given the opportunity for review and comment.

Section 1(C) establishes an "environmental monitoring program" which focuses on determining violations of established federal, state, and local laws and not on determining the occurrence and extent of environmental impacts caused by oil shale industry operations. (3, V-46).

As a result, some impacts may be overlooked, and the Department will not be able to devise measures to minimize such impacts. Section 1(F) provides for briefings on environmental matters for the lessee's supervisory personnel by federal and state employees. Periodic briefings of the public and federal and state personnel on the results of the environmental protection measures should be required as well to help ensure that the environmental protection criteria of the program are being met.

Historic, archaeologic, and scientific values are protected, in theory, by section 6. (3, V-59). However, questions whether objects are of "scientific or historic interest" shall be brought "to the attention of the Mining Supervisor for final determination." The Mining Supervisor will probably be unqualified to make such a determination. The Draft Statement itself suggests that an expert be

retained for just such a purpose (1, IV-18 to -19).

Finally, in several areas the Mining Supervisor is granted complete discretion to make important environmental protection decisions. At a minimum the public should be involved in the decisionmaking process, and, in some instances other federal agencies should also participate. Section 2 provides that the lessee shall submit plans for construction of roads, pipelines, and utility requirements such as electric transmission lines to the Mining Supervisor for approval. (3, V-48a). No mention is made of the airstrip which may be constructed. (3, IV-35, VI-6). These plans are not required to be made public. Apparently normal permit and licensing requirements do not apply to these activities, including the preparation of NEPA statements. Section 4(A) provides that the lessee shall submit plans for protecting fish and wildlife habitat to the Mining Supervisor for approval. (3, V-56). When destruction or significant disturbance of fish and wildlife and/or their habitat is inevitable, the lessee must submit a plan for avoiding, minimizing, or repairing injury to fish and wildlife to the Mining Supervisor for approval 60 days prior to the destruction;

silence on the part of the Mining Supervisor constitutes approval of the plan. (3, V-56 to -57). These plans are not required to be made public. No indication is given that the Mining Supervisor must consult with the Bureau of Sport Fisheries and Wildlife, although under the Fish and Wildlife Coordination Act such consultation normally occurs with respect to federal projects. Moreover, despite the Mining Supervisor's probable lack of expertise for approving such plans, his formal approval should be required. He can consult with others having more expertise; moreover, letters can get lost and the environment should not be at the mercy of mistake or oversight.

Central to the environmental protection provisions of the stipulations is the requirement that the lessee submit plans outlining environmental protection techniques which the Mining Supervisor must approve. But the Mining Supervisor is unlikely to have expertise in all the areas over which he has jurisdiction. And it is likely that once land has been leased and these subsidiary land use requirements become applicable, interest on the part of the government and industry in minimizing environmental impacts will decrease in proportion to the marginal costs

of such activities and their resulting impacts on the price of oil produced. In fact, one of the standards for environmental protection decisionmaking is "to the extent practicable," which suggests that economic criteria may govern environmental protection decisions. In order to ensure that environmental impacts are minimized, environmental protection plans prepared by lessees should be approved only after consultation with relevant experts in federal, state, and local agencies, and only after the plans have been made public and interested members of the public have had an opportunity for review and comment.



## VII. CONCLUSION

The actions of the Department demonstrate a lack of concern for the NEPA requirement that federal agencies assess proposed actions and take all practicable means to enhance and protect the environment. Mere preparation of NEPA statements is no substitute for adequate decisionmaking. On the other hand, carefully prepared, adequate NEPA statements can do much to ensure that proper decisionmaking takes place, as well as providing evidence that it has taken place. For reasons set out in detail above, NRDC believes that this Draft Statement is so inadequate in its discussion of both environmental impact and alternatives -- particularly the alternative of leasing no tracts or fewer tracts -- that the Department is required to issue a new draft impact statement which remedies these inadequacies.

Preparation of a revised draft statement and serious consideration of the reasonable alternatives may result in a decision not to implement the proposed prototype oil shale program or to modify it substantially. However, if and when a decision is made to implement the proposed program, NRDC recommends that in order to ensure that the R&D and minimal environmental impact goals of the program are realized:

1. The Department establish a tract selection committee including public experts (e.g., ecologists, biologists, mining engineers, civil engineers) which would recommend to the Department the tracts to be leased. The tract selection committee which nominated the six currently proposed tracts consisted only of federal and state government experts; their tract selections appear to have been based on factors other than the avowed purposes of the program.

2. The Department establish a lease form committee including expert members of the public (e.g., lawyers, ecologists, biologists, engineers) to assist in preparing a lease form which would ensure that the principal goals of the proposed prototype oil shale leasing program are met. The lease agreement determines the manner in which oil shale production will proceed and is the most important document of the proposed program. The proposed lease form does not assure that the environment will be protected, even though this is supposed to be one of the basic purposes of the program.

3. The Department establish a program review committee, including a substantial number of public experts,

which will receive regular reports on the administration, implementation, and enforcement of the proposed prototype oil shale leasing program in order to ensure that it is conducted in accordance with its purposes and that no further leasing occurs until there has been careful evaluation of the results of the prototype program.

ATTACHMENT TO COMMENTS OF:

NATURAL RESOURCES DEFENSE COUNCIL  
SIERRA CLUB  
NATIONAL WILDLIFE FEDERATION

ON DRAFT ENVIRONMENTAL STATEMENT  
FOR THE PROPOSED PROTOTYPE OIL SHALE  
LEASING PROGRAM (SEPTEMBER 1972)

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Comments of

Natural Resources Defense Council

on

Prototype Oil Shale Leasing Program

Draft Environmental Impact Statement

Submitted by:

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February 29, 1972

## I. INTRODUCTION

The Natural Resources Defense Council (NRDC) finds this draft statement inadequate, both in scope and content, to comply with the requirements of the National Environmental Policy Act (NEPA), in particular sections 102(2)(C) and (D).<sup>1</sup> NRDC's comments will focus on the major deficiencies, which consist primarily of omissions of (1) material environmental impact information and (2) detailed discussion of reasonable alternatives to the prototype oil shale leasing program and their environmental impacts. Although this draft statement is only a preliminary statement, the Department has indicated that the supplemental statement will be concerned only with the environmental impacts of the proposed program on the specific tracts to be leased.<sup>2</sup> Therefore, NRDC believes that the Department

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<sup>1</sup> / 42 U.S.C. §§ 4332(2)(C), (D).

<sup>2</sup> / U.S. Dept. of the Interior, Prototype Oil Shale Leasing Program Draft Environmental Impact Statement i, II-4 to -5 (June 1971) [hereinafter cited as Draft Statement].

should prepare and circulate a new draft environmental impact statement which discusses in detail the environmental impact of the oil shale leasing program and its reasonable alternatives.<sup>3</sup>

## II. ENVIRONMENTAL IMPACT

### A. Of Prototype Leasing Program.

The discussion of environmental impact of the proposed program is seriously inadequate in a number of areas.

1. Land. The draft statement details the mammoth amounts of waste shale that will be generated by the prototype leasing project and indicates that the wastes will be disposed of by filling canyons and the open pits caused by strip mining. These disposal sites will then be restored through revegetation. The draft statement does not state whether and to what extent growing vegetation on the waste piles of processed shale depends on continued fertilization and watering. The statement notes that "additional investigation" is needed to determine if processed shale can

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<sup>3</sup> / Natural Resources Defense Council, Inc. v. Morton, Dkt. No. 2397-71 (D.D.C. filed Feb. 1, 1972).

support long-term vegetation.<sup>4</sup> Since only in situ processing does not produce large piles of processed shale waste and this is the least likely process to be used,<sup>5</sup> whether long-term vegetation can be supported on shale wastes is critical to determining whether the Department can meet its irrevocable commitment to maintain the integrity of the environment.<sup>6</sup> These wastes will amount to about 1500 acres per lease over the twenty-year period of production presently contemplated.<sup>7</sup> Before the Department undertakes the prototype program, the Department must discover by investigation and present in its draft statement reliable information regarding the viability of revegetation.

2. Water supply and quality. The draft statement states that at the end of six years the prototype leasing program will require approximately 30,000 acre-feet of water annually from the Upper Colorado

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4 / Draft Statement III-11.

5 / Id. at III-38 to -39.

6 / U.S. Dept. of the Interior, Press Release of June 29, 1971, "Secretary Morton Announces Draft of Interior's Plans for 'Prototype Program' of Oil Shale Development" at 2.

7 / Draft Statement III-6.



River Basin, of which 11,000 to 18,000 acre-feet would be treated for further use and discharged. The draft statement does not discuss what processes will be used to meet the "no degradation" goal adopted by the Department<sup>8</sup> and how reliable these processes are. The draft statement also fails to provide detailed information concerning the total water resources available and the water requirements of the prototype program and its important constituent elements, such as the industry, the employees' families, and satellite services.<sup>9</sup> Since the region is semi-arid and since claimants for water from the Colorado River are many and primarily downstream, this

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<sup>8</sup> / Id. at III-17.

<sup>9</sup> / The 30,000 acre-feet water requirement noted in the draft statement apparently includes the needs of both the industry and the employees' families and satellite services. See U.S. Dept. of the Interior, Prospects for Oil Shale Development, Colorado, Utah, and Wyoming 99-100 (May 1968) [hereinafter cited as Prospects for Oil Shale Development (1968)]. Because of the critical importance of water to the maintenance of the area's environmental integrity, the operation of the oil shale industry, and the increased urbanization of the area, the water needs of each sector should be detailed in the statement. This is necessary because important decisions relate directly to the water resource requirements of these sectors such as their different water quality needs and effluent treatment requirements. Moreover, these three sectors are not the only ones for which water requirements are critical and for which the draft statement must provide detailed information. See note 18 supra.

information is of critical importance to the environmental and economic feasibility of the project. The draft statement must, for example, project the total water supplies available;<sup>10</sup> the frequency of drought years; the total demands for the water, including those of downstream claimants; and the demands of the major elements of the entire prototype program.

3. Recreation. One of the most important goals to which the Department has committed itself -- preserving the area's environment -- can only be achieved by assuring that present parks and wilderness areas are preserved and that other lands suitable for preservation as park and wilderness areas are set aside before the project begins. The draft statement suggests that presently designated parklands will be preserved but little additional land. The Department must discuss in detail its plans for preserving park and wilderness areas other than those presently designated, or state

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<sup>10/</sup> If the total supplies include the treated effluent from the oil shale industry, the reliability of the treatment process and the probability of achieving a "no degradation" goal must be discussed in the draft statement.

why it has adopted a different policy. The Department should consider developing a nomination system, similar to the one it employs for selecting the oil shale lease tracts, and in which the public could participate, for determining which lands should be preserved for further development.

B. Of Full-Scale Oil Shale Industry.

The Department's oil shale leasing program is part of the "President's comprehensive energy program to help assure future energy supplies,"<sup>11</sup> which the President announced in his Energy Message of June 4, 1971. A primary goal of the prototype program is "to stimulate the development of commercial oil shale technology to ensure that oil from shale will be available as a future domestic supply option when needed."<sup>12</sup> The

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11/ U.S. Dept. of the Interior, Program Statement for the Proposed Prototype Oil Shale Leasing Program i (June 1971) [hereinafter cited as Program Statement].

12/ Draft Statement II-1. In the Department's publication United States Energy: A Summary Review (Jan. 1972) the objective of the program is stated to be: "To stimulate commercial development on public lands . . ." at 54. See also the Department's press releases of June 29, 1971, at 2, 4, and July 15, 1971, which transmits Secretary Morton's remarks to the National Petroleum Council, at page 6 of the remarks.

broad scope and objectives of the program are outlined in the Program Statement: "Through proper planning, it is believed that this proposed program would, on balance, benefit the nation as a whole as well as the oil shale region itself."<sup>13</sup> Discussion of the environmental impact of this broad program is entirely missing from the draft statement although it will be substantial: the region to be developed is a sparsely settled, semi-arid region with approximately three people per square mile; the nearest cities are more than 200 miles away.<sup>14</sup>

Since the Department has stated that it "is irrevocably committed to maintain[ing] . . . the environmental integrity of the oil shale area,"<sup>15</sup> detailed discussion, to the fullest extent possible, of the environmental impacts of a full-scale industry is necessary (1) to determine whether the prototype leasing method chosen involves adverse environmental impacts which would be apparent only after development of the larger industry and which could be avoided, and

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13/ Program Statement ii.

14/ Draft Statement III-1.

15/ Note 6 supra.

(2) to an adequate evaluation of alternatives to the proposed prototype program. Examples of the kind of environmental impact information that must be presented and its relevance to these two issues follow.

1. Environmental impacts. The statement notes that certain wildlife species are insensitive to human encroachment. In general, the impact statement appears to assume that the impacts on such resources as air quality, fish and wildlife, and the land will be roughly proportional to population growth.<sup>16</sup> Detailed information to support such a conclusion must be included in the draft statement since it seems likely that the impacts of a full-scale industry as compared with the prototype would be more than proportional, making it extremely difficult to maintain the environment of the area. As one extremely important example, the statement notes that water is scarce in the oil shale area. The draft statement must present detailed information regarding the availability of water resources for meeting the enormous demands of a full-scale industry and the new inhabitants and supporting services such an industry will attract.

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<sup>16/</sup> Draft Statement III-1 to -2.

2. Avoiding impacts caused by a full-scale industry. Unless attention is given to problems such as those just mentioned, options for avoiding or minimizing them may be foreclosed by decisions to accommodate the prototype program. For example, the draft statement indicates that specific measures will be taken to minimize the adverse impacts on such resources as wildlife by providing lease conditions which "will assur[e] that the lessee would . . . protect fish and wildlife and their habitat from damage by mining and surface operations."<sup>17</sup> Under conditions of full-scale industry operation, it may be necessary to require not only more restrictive lease provisions than would be required for the prototype industry, but additional ones as well, both of which must also be applied to lessees under the prototype

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<sup>17/</sup> Id. at IV-8.

program.<sup>18</sup> In particular, none of the contemplated lease provisions deal with the problems posed by increased urbanization of the area.

Two other examples deal with the problems posed by urbanization. If analysis indicates that there will be insufficient water resources to meet the needs of the industry and of employees' families

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<sup>18/</sup> Similar issues arise with respect to the mineral extraction industry that may be developed. It is planned to permit the lessee to extract sodium mineral compounds or other minerals which occur in the leased lands intermixed and intermingled with deposits of oil shale. "Proposed Oil Shale Lease," Program Statement app. B, at B-1. No environmental impact information about such an industry is presented in the draft statement. Such information must be included in the statement since important decisions depend on it. For example, the statement must provide information regarding the availability of water resources for a mineral extraction industry as well as a full-scale oil shale industry. The Department's 1968 oil shale report stated that "the mineral-extraction industry would have to compete for water with oil-shale processing. When the size of the shale-oil industry approaches 1 million barrels per day in Colorado, the size of the mineral extraction industry may be limited by the availability of water since the water consumption for recovering minerals from a given sized shale-oil plant are several times higher than the maximum expected for all other processing operations (including oil shale) and for urban requirements." Prospects for Oil Shale Development (1968), at 73. Thus, the lease provisions may have to be changed to prohibit multiple mineral extraction operations. And if lessees cannot operate mineral extraction processes together with oil shale operations, the type of oil shale process chosen may differ as well as its environmental impacts.

located near the working sites, then decisions must be made now to ensure that no urban growth is permitted to occur within the area, a decision contrary to that proposed in the draft statement. If studies demonstrate that increased urbanization will have a relatively greater impact on fish and wildlife than expected, then more land must be preserved now to provide sanctuary and a buffer than would be required for the prototype program.

3. Evaluating alternative prototype programs.

One example of the considerations involved in relating the environmental impact of the larger industrial program to decisions with respect to the prototype program concerns the problem of disposing of the mammoth amounts of waste shale which will be produced. Thus, at the prototype stage consideration ought to be given to encouraging the development of that process which minimizes this problem, rather than providing equal resources to alternative processes, and to locating the industry in a place where disposal problems are minimized, rather than choosing the area which has the richest shale.



### III. ALTERNATIVES AND THEIR ENVIRONMENTAL IMPACTS

The draft statement considers only three alternatives to the proposed prototype leasing program, none of which involves resources other than oil shale or purposes other than development of an oil shale industry. Moreover, the entire discussion of alternatives to the proposed prototype program is encompassed in three double-spaced typed pages. This is not the detailed discussion of reasonable alternatives and their environmental impacts required by NEPA.<sup>19</sup>

Some of the reasonable alternatives, together with their environmental impacts, which are not discussed in the draft statement in the detail required by NEPA are described below. This list of examples is not inclusive; it is the duty of the Department, not of NRDC, to identify and discuss in detail all reasonable alternatives to this

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<sup>19/</sup> 42 U.S.C. §§ 4332(2)(C)(iii), (D); Exec. Order No. 11514, § 2(b), 35 Fed. Reg. 4247 (1970); CEQ, Guidelines, § 6(a)(iv), 36 Fed. Reg. 7724 (1971); Dept. of Interior, "Statement of Environmental Impact," Dept. Manual, pt. 516, ch. 2, § 6.C(8), 36 Fed. Reg. 19343 (1971); Natural Resources Defense Council, Inc. v. Morton, Dkt. No. 71-2031 (D.C. Cir. filed Jan. 13, 1972), aff'g 3 ERC 1743 (D.D.C. 1971).

federal action.<sup>20</sup>

Two aspects of the prototype leasing program must be considered in determining the reasonable alternatives:

(1) a substantial amount of federal research and development funds will be expended for studying and monitoring the program (this amount must be quantified in the statement); (2) a small operating oil shale industry will be developed which will produce about 200,000 barrels per day (b/d) of oil and will cause substantial adverse environmental impacts. Reasonable alternatives to the prototype program are:

A. Cancel or Delay Leasing.

1. Use the research and development (R&D) funds for R&D directed toward other energy sources such as:

- (a) underground and/or aboveground storage of oil to make possible more oil imports;
- (b) coal gasification and/or liquefaction;
- (c) solar energy;
- (d) magnetohydrodynamic power cycles (MHD);

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<sup>20/</sup> The Department itself has recognized their relevance by discussing several "available energy options" and "future supply options" to the oil shale leasing program in the Program Statement ch. VI, §§ B,D.

- (e) nuclear stimulation of natural gas resevoirs;
- (f) liquid metal fast breeder reactor (LMFBR);
- (g) advanced reactor concepts other than the LMFBR, such as gas cooled, molten salt and light water breeder reactors;
- (h) controlled thermonuclear fusion;
- (i) improved techniques for finding and producing oil and gas, onshore and offshore;
- (j) fuel cells;
- (k) tar sands;
- (l) developing methods of reducing the rate of growth of energy consumption.

The first alternative above -- developing underground and/or aboveground oil storage methods -- would permit essentially unlimited imports of oil while assuring national security, thus increasing the nation's oil supplies while probably causing relatively insubstantial adverse environmental impacts. An investment in this area could be extremely productive. The Cabinet Task Force on Oil Import Controls recommended study of this alternative in its report to the President in

February 1970.<sup>21</sup>

The next seven alternatives noted above were mentioned by the President in his Energy Message of June 4, 1971. In discussing these R&D programs, the President stated that the "key to meeting our twin goals of supplying adequate energy and protecting the environment in the decades ahead will be a balanced and imaginative research and development program."<sup>22</sup> The President's energy advisors have testified that the message was not such a program and that it remains to be developed.<sup>23</sup>

The Department discussed the next three alternatives -- among a number of others -- in its Program Statement on the oil shale program

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<sup>21/</sup> Cabinet Task Force on Oil Import Control, The Oil Import Question ¶ 245; see also ¶ 419, 424, app. J, ¶¶ 1-5 (Feb. 1970).

<sup>22/</sup> President, White House Press Release, June 4, 1971, at 6.

<sup>23/</sup> Paul W. McCracken, Chrm., Subcomm. on Nat'l. Energy Situation of Domestic Affairs Council (speaking for all subcommittee members), and Chrm., Council of Economic Advisors, at Hearings before the Comm. on Interior and Insular Affairs on The President's Energy Message, 92d Cong., 1st Sess. 7 (June 15, 1971).

and/or its recent publication -- United States Energy: A Summary Review.

The alternative of reducing the rate of growth of energy consumption is an available means for meeting energy needs. This alternative has not been studied by the government although its importance and relevance has been recognized. The Chairman of the Federal Power Commission, John N. Nassikas, delivered a statement to the Joint Committee on Atomic Energy in March 1971, which stated:

Some have suggested that energy consumption is growing at too rapid a rate and thereby causing an excessive drain on our resource base, and that energy production is associated with large social costs which threaten to outweigh its benefits. This is a viewpoint which certainly deserves careful and thoughtful study . . . 24

The Energy Policy Staff of the Office of Science and Technology stated in a report issued in 1970

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24/ Statement of John N. Nassikas, Chrm., Federal Power Commission, Mar. 23, 1971, for the Joint Committee on Atomic Energy, U.S. Cong., at p. 1.

that the question of reducing the rate of growth in national power generation capacity "require[s] a great deal of public thought and discussion, for [the answers] will affect both the economy and the environment for decades to come."<sup>25</sup>

2. Obtain the 200,000 b/d of oil expected to be produced by the prototype oil shale industry instead from:

- (a) increased oil imports;
- (b) elimination of state market-demand rationing;
- (c) changing Federal Power Commission gas pricing policies; or
- (d) reducing the rate of growth of energy consumption.

The oil import quota restrictions would have to be modified only marginally to meet the 200,000 b/d that would be produced by the prototype program, probably causing substantially less adverse environmental impacts. The Cabinet Task Force on Oil Import Controls recommended in 1970, by a five to two cabinet-level vote, that restrictions on oil

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<sup>25/</sup> Energy Policy Staff, Office of Science and Technology, Electric Power and the Environment 48 (Aug. 1970).

imports be considerably relaxed. The Task Force found that this would permit importation of several millions of barrels of oil per day without endangering national security.<sup>26</sup>

Recovery from existing oil fields in Louisiana and Texas could be increased on the order of 1.2 million b/d by eliminating the state market-demand prorationing system which restricts production in these states.<sup>27</sup> This could be accomplished by a Presidential proclamation suspending operation of the Connolly Hot Oil Act<sup>28</sup> and ensuing court action by the Federal Government under the Commerce Clause and antitrust laws; this same result could be obtained by congressional action repealing the Act. A study prepared for the Joint Economic Committee of the United States Congress suggested that the President is required to suspend the Act's operation

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<sup>26/</sup> Cabinet Task Force on Oil Import Control, The Oil Import Question (Feb. 1970).

<sup>27/</sup> Id. at ¶ 408.

<sup>28/</sup> 15 U.S.C. §§ 715 et seq.

now because of the existing lack of supply-demand parity which unduly burdens interstate commerce.<sup>29</sup> The Cabinet Task Force on Oil Import Controls also discussed this alternative in its report, noting that the prorationing system would become pointless if import controls were significantly relaxed.<sup>30</sup>

Changes in the pricing policies of the Federal Power Commission would encourage exploration, discovery, and production of gas and oil. The Council of Economic Advisors has informed the President that "[t]he only satisfactory solution to this problem (of inadequate supply development) is to allow the price, at least of new gas not previously committed, to approach market clearing level."<sup>31</sup>

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29/ U.S. Cong., Joint Economic Committee, Report on Crude Oil and Gasoline Price Increases of November 1970: A Background Study 92d Cong., 1st Sess. 15-19 (Nov. 3, 1971).

30/ Cabinet Task Force on Oil Import Control, The Oil Import Question ¶ 408 (Feb. 1970).

31/ Dept. of the Interior, United States Energy: A Summary Review 38 (Jan. 1972).



B. Modify the Prototype Leasing Plan.

1. Lease fewer tracts. The draft statement is based on leasing six tracts of land two each in the states of Colorado, Utah, and Wyoming. The statement provides no information, however, about this decision. The prototype leasing program:

seeks to establish a new cooperative effort between the private and public sectors to assess the complex relationship between the development of oil shale and environmental maintenance. By necessity existing technology would be modified and new technology developed both for extracting the oil and for reducing the environmental impact.<sup>32</sup>

The draft statement demonstrates that substantial adverse environmental impacts will occur even if only one tract is leased. It is not obvious that the experimental objectives of the program can best be met by leasing six tracts. The Department's 1968 oil shale report, for example, recommended that two tracts be leased.<sup>33</sup> The draft

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32/ Draft Statement I-1.

33/ Prospects for Oil Shale Development (1968), at 129.

statement must discuss in detail the basis on which the decision to lease six rather than one, three, or ten tracts, for example, was made, and the environmental impacts of these reasonable alternatives.

2. Change lease conditions. The draft statement indicates that the principal measures adopted by the Department "to minimize and mitigate certain types of undesirable [environmental] impacts" are lease provisions<sup>34</sup> which "are designed to assure that the lessee would . . . [for example] protect fish and wildlife and their habitat from damage by mining and surface operations."<sup>35</sup> The specific lease provisions have not been formulated, however, and none of them deal with the

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34/ The Department has indicated that it will institute a monitoring program to aid in ensuring compliance with these objectives. The details of the monitoring program, such as personnel, equipment, and methods, are not mentioned in the draft statement. The monitoring program itself may be changed in the light of changed lease conditions and/or new law or regulations. Detailed discussion of the monitoring program must be presented in the impact statement, including whether such a program would be more effective if based on regulations rather than lease conditions.

35/ Draft Statement IV-8.

destructive impacts of increased urbanization. The draft statement must provide the actual language of the lease conditions. The statement must also identify, as appropriate, alternatives to these conditions and their relative expected effectiveness in avoiding or minimizing environmental impacts.

The draft statement suggests that the principal means of assuring adequate land reclamation and restoration is the bond requirement which lessees must post. The bond provisions have been drafted and provide that the bond amount may not be less than \$500 per acre of land estimated to be affected nor less than \$2000 in total.<sup>36</sup> This amount seems far too low<sup>37</sup> to ensure that "the approved development-restoration plan would be

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36/ Program Statement B-15 to -16.

37/ The January 1972 newsletter of the Conservation Foundation reports:

One Bureau of Mines Study, completed in 1965, concluded that the cost of restoring a natural slope was \$15.73 per linear foot of highwall, or about \$2,700 per acre. In an Elkins, West Virginia, demonstration project, the average cost for reclamation of 561 acres, exclusive of clearing and vegetation, was \$1,685 per acre. CF Letter, Jan., 1972, at 2.

See E.A. Nephew, "Healing Wounds", in 14 Environment no. 1, at 12, and report of J. McCaull, in id. at 14 (Jan./Feb. 1972).

conducted in a manner designed to avoid degradation of the environment and that all other related lease terms would be met."<sup>38</sup> The draft statement must provide detailed information with respect to the expected costs of land reclamation and restoration, the cost experiences of others, such as the Tennessee Valley Authority, and similar information on the related lease terms so that independent assessment of the proper bond amount may be made.

3. Enact environmental protection legislation and/or regulations in addition to or rather than relying on lease provisions. Federal law governing the development of an oil shale industry is probably ineffective for meeting the stringent environmental protection goals enunciated by the Secretary and the draft statement with respect to oil shale development.<sup>39</sup> This may explain why the lease

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38/ Draft Statement IV-9.

39/ Concerning federal control of strip mining, the CF Letter reports:

The only existing federal control consists of Interior Department regulations for mining on public and Indian lands over which the federal government has jurisdiction. The record to date, however, suggests to many observers a need for substantial regulatory change. A maze of statutes, regulations, field manuals, bureaucracies and traditions governs the (cont.)

conditions are the principal method adopted by the Department for ensuring the environmental integrity of the area. Contract provisions may be much less effective than statutory or regulatory controls, however, The draft statement must analyze the relevant laws and regulations and discuss why the Department decided to rely

---

39/ (cont.)

administration of coal strip mining on federal lands. Control functions are further hobbled by vague lines of authority, conflicting powers, and serious understaffing in critical positions.

The laws themselves do not even mention strip mining. Nor do they prohibit stripping in wilderness or proposed wilderness areas. . . .

. . . .

At the heart of the administrative system are regulations promulgated in 1969 by Interior (43 CFR 23 and 25 CFR 177). They place great responsibility for environmental protection on the Bureau of Land Management and the U.S. Geological Survey, agencies which also are interested in facilitating the extraction of minerals. Like the state laws, these regulations do not apply retroactively . . . And even where they do apply, the regulations are weak. They grant the BLM and USGS no clear authority to prohibit stripping in particular regions. The regulations also do not authorize sanctions that could be applied quickly against a stripper who violates his mining or exploration plans. They do not provide specific reclamation standards. Staffing and inspection capabilities are sadly inadequate. In addition, the regulations provide little check on agency activities, for there are no provisions for public participation. CF Letter, January, 1972, at pages 11-12.

on contract law rather than seek appropriate legislation and/or develop regulations.

#### IV. CONCLUSION

NRDC believes that the draft statement is so inadequate in its discussion of both environmental impact and alternatives that the Department is required to issue a new draft impact statement which rectifies these inadequacies and on which interested parties may have an opportunity to comment. And NRDC believes that prior to issuing this new draft statement the Department is legally obliged to consult with (1) government agencies -- federal, state, and local -- other than the Department which have jurisdiction by law over any of the reasonable alternatives to the prototype oil shale program; and (2) federal agencies having jurisdiction by law or special expertise with respect to any environmental impact involved, including the environmental impacts of reasonable alternatives to the oil shale leasing program.



LETTER NO 40

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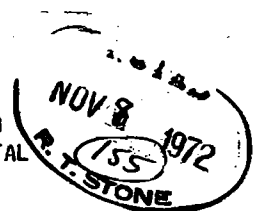
PMS PRES NIXON

WHITEHOUSE DC

DEPARTMENT OF INTERIORS ENVIRONMENTAL IMPACT STATEMENT ON  
OIL SHALE DEVELOPMENT PROGRAM IS INADEQUATE. FULL STUDY NEEDED OF IMP  
ACT  
ON WATER RESOURCES HABITAT AND WILDLIFE  
DR CAROLYN R MORRILLO PRES ORLEANS AUDUBON SOCIETY

Identical telegram sent to Secretary Morton, Department of the Interior

STATEMENT BY CHARLES PARKS FOR PLAN AURORA TO BE ENTERED INTO  
INTO THE HEARING RECORD AS TESTIMONY ON THE DRAFT ENVIRONMENTAL  
IMPACT STATEMENT FOR THE PROTOTYPE OIL SHALE LEASING PROGRAM



The review of the draft environmental statement concerns socio-economic planning.

How will the development affect the existing population, and how will new people be provided with necessary services? The statement is very incomplete in this area.

Many people viewed the National Environmental Policy Act of 1969 as an end to planning in a vacuum. Section 102 of the Act requires that:

- (A) A systematic, interdisciplinary approach be utilized.....
- (B) A detailed statement on
  - (i) the environmental impact of the proposed action
  - (ii) any adverse environmental effects which cannot be avoided.....
  - (iii) alternatives to the proposed action
- (C) make available to the states, counties, municipalities, institutions, and individuals advice and information useful in restoring, maintaining, and enhancing the quality of the environment.

The statement is very deficient in this area of problem solving. Generally, unless the socio-economic considerations are greatly expanded on in the final statement, the impact statement will be seriously deficient.

The draft statement does not cover several areas of major impact. The first of which is the varying population levels that may occur. Second is the potential of large scale unemployment that could come during the early part of the program. During the construction phase, the possibility of strikes has been only briefly covered, and there is the possibility of winter shutdowns. The economic effect on the workman's camps and county welfare programs has not been covered. Similarly since this will be an experimental program, the potential start up and shut down, restart and shut down of plants has not been considered and evaluated. A major revamping of plant facilities could result in most production workers being layed off (and hence on unemployment ins and welfare programs) while at the same time ad-

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 HEARINGS & APPEALS



ditional facilities for housing the temporary workers of construction would be required

And since in spite of the "20yr lease" there is no guarantee of continued operation, there is always the possibility of a "Boom-and-Bust" situation.

Economics plays a part in this possibility and relates directly to our energy needs. It is felt that a Comprehensive Energy Policy is needed to truly evaluate the likelihood of this impact. Without such a policy there is much more of a chance of a "Boom and Bust" situation. The statement does not concern itself with the boom and bust potential, a very real possibility. The writers of the statement should look into the impact of shutting down the ABM construction projects, the problems created in many areas of the country with the construction of missile bases, and problems in areas like Las Cruces, New Mexico, whose economic well-being goes up and down as government contracts come and go at nearby White Sands Missile Range. A complete study of our energy requirements would provide a better look at the future of oil shale, as well as the need to develop other resources. The leases contain provisions to protect the industry if the development is not economical or is not needed. But there is nothing in the statement that covers how the people and local governments will be protected.

Another potential problem is the land speculation. Any potential influx of people can cause land speculation. Speculation in land causes an increase in land values, and in turn an increase in property taxes. The speculator generally is favored by our tax structure on both the Federal and State levels, while the people in the area not wishing to sell their land have a problem. The increase in land value and taxes is not matched by an increase in productivity of the land. In many parts of Colorado people are being forced off the land by increasing taxes based on speculative land values. What is the impact of land speculation on the present pop-

ulation? What can be done to minimize or alleviate the impact of land speculation?

And, with the first influx of people, comes the housing impact. Any one who goes into a boom area is familiar with what happens to housing. The house that once rented for \$80/month goes to \$160/month as construction starts and to \$240 and up as people flood into the area. This is fine for the people who benefit from the boom. The wages of the construction worker may reflect high housing costs; but what is the impact on the person who pumps gas or works in the local store? What is the impact on a large percentage of the existing population to whom the project will mean higher costs with no equivalent increase in income? What actions should be taken to protect these people?

Another impact which has not been adequately considered is the potential influx into the area of people looking for work, people who do not have jobs, and may not even be qualified for employment in oil shale, but who are drawn to the area in search of some kind of employment or a better paying job. Just what is the potential? What is the impact on services or welfare rolls? And what is proposed to control or eliminate this potential problem? Similarly, will this project add to the State's total population? Can preference be given to people in the particular states who are unemployed or under-employed? Can population be relocated from presently congested urban areas in Colorado and Utah into the areas where oil shale is being developed? Or will additional people from the outside be brought into the area?

The impact statement has not covered or provided an inventory of urban or people-oriented type of facilities that presently exist in the area. A study of facility costs in the Denver area shows approximately \$11,500 in capital construction costs

per family. On a per person base; \$1100 in streets and highways, \$1070 in schools, \$410 in water, \$200 for parks, 200 hospitals, \$150 sewage, \$ 10 libraries, \$ 9 fire protection, and \$3 police. It is necessary to know what needs to be built, what is existing, before true costs and their impact can be assessed.

And the problem of timing must be considered. It is interesting to note that in some government programs, such as the ABM construction , the facilities were built by the government. The report simply states that there are many problems, it does not study or propose ways to solve the problems in the urban/people area created by the oil shale leasing. For example, the government could build the needed facilities-with a pay book from the oil shale revenues. If the revenues do not meet expectations, then the local tax payers do not suffer. This is an area that need some study.

Also the fact that the tax base may be in one county, while the population is in another is noted, but no suggestions are given as to how to solve this problem. Yet there are several possible solutions. The federal government could rewrite the lease so that the plant becomes property and thus does not go on the tax rolls. The lease could require that payments be made on a voucher system in lieu of taxes. This system is presently used by the Federal Government to provide aid to schools in areas of major governmental installations. Or as an Alternative, a regional authority could be established by the states or districts involved. The Federal ownership in lieu of taxvoucher system would be easy to establish but would not cover and developments outside of Federal lands. A regional system would cover both private lands and facilities of Federal properties, but with the problems of inter-governmental cooperation that presently exist, a regional government would be hard to form. These are but a few of the problem areas noted in the draft statement

for which there may be answers, but no study of alternatives has been made.

Once the various impacts are defined in sufficient detail, it would be possible to work out solutions, rather than just state that there are problems and let it go at that. A number of potential problems could be solved by Federal actions, and others could at least be presented to the states counties and municipalities, with possible solutions as required by Section 102(F) of N.E.P.A.

There is no need to continue to point out problems which are already raised in the draft statement, they have been presented, however a complete study of the problems and alternatives should be explained in the final statement. Since the crude oil shale is being sent out of the area for processing. What is the impact in terms of population, pollution, etc. on the area where the refining will be provided? The statement also refers to the work being done in Garfield, Mesa, and Rio Blanco Counties in Colorado, but what is being done in Moffet County Colorado to cover any possible spill over development?

The "Changes in Socil-Economic Patterns" Vol I, VII-6D, say"s that the urban enviroment, (the industrial way of life) is far better than the agricultural type society. Studies of industrial areas,urban socities,show a majority of the people would like to leave, to get to the less complex, more enjoyable agricultural society. How do the people currently living in the area feel about the proposed progress that is being forced upon them from the outside. There is no doubt that most welcome the idea of more money, yet few will get more money, and how will they except the other benifits of our urban industrial society? Will they also welcome drugs; God-is-dead; disrespect for the people, the country, the flag? Have the attitudes of the people been surveyed, not

only to determine their feelings , but also to guide the outsiders who will control what changes take place, so that they have the least impact on the people presently living in the area?

In the non-urban area,(see Comments Volume II, Energy Alternatives) the possible effects of a fuel shortage have not been evaluated. The statement notes that a 4% increase on fuel costs would only raise operating costs by 1%, yet many people are looking at a 200% price increase. For a 100% price increase (assuming the 4:1 ratio would still hold), the \$1300 per year car costs would go to \$1625. Thus a 2-car family could expect a \$650 increase, or a total of \$3250 after tax dollars, to operate at today's levels. This is 25% of the pretax earning of a \$12000-per-year family. With the increasing costs of everything , something will have to give, and it will probably be the second car. The estimates for the Metro Denver area is that 50% of the trips are to work or school. Both of which could easily be served by mass transit.

Could a major increase in fuel costs spur mass transit, reduce pollution as a side effect, reduce the amount of raw materials used in auto production. Also, would a major price increase encourage new technology in secondary recovery of existing oil reserves? With a price increase what other fuel sources and supplies would become available?

An interesting area of potential fuel that was completely overlooked in the statement was fuels from organic sources. If we were to use oil on a sustained yield bases, we would be able to start our cars once a year. However organic fuels, such as alcohol, could be produced on a sustained yield. During World War II, oil-short Germany used alcohol as a fuel, and a number of plants were built in this country. What are the possibilities for alcohol, methane, and other organically produced fuels? And what benefits would occur to our agricultural industry?

Could government payments for not growing be replaced with fuel crops and increased farm employment? What is the potential with our present technology, and what possible breakthru's could be expected by say 1980-1985?

This of course is just the Draft Statement, but much work needs to be done to cover the impact of the proposed leasing and potential of development at this time.

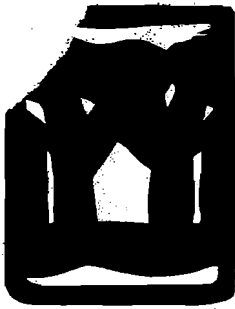
The State of Colorado is working on ideas to divert people away from the existing Metropolitan areas into the less populated area's of the state.

However, just where the people should go, where they can be located and sustained without destroying the environment, has not been determined. Like all minning, sooner or later the shale will be exhausted. Just how long will it take to mine out the shale, assuming production is economical, and what will happen to the area when the shale is gone?

Charles Parks

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Aurora, Colorado 80010



# ROMCOE

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## ROCKY MOUNTAIN CENTER ON ENVIRONMENT

4260 East Evans Avenue • Denver, Colorado 80222 • 303/757-5439



October 10, 1972

The Honorable Rogers C. B. Morton  
Secretary of Interior  
Interior Building, Room 6161  
C Street between 18th & 19th Streets, N.W.  
Washington, D. C. 20240

Action for info only *Reed Stone*  
*FW-Reed*  
*OP*

Dear Secretary Morton:

The Department of the Interior and the Oil Shale Task Force should be complimented on a considerably improved and responsive environmental analysis as manifested in the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, September, 1972.

To quote from the ROMCOE "critical review," a copy of which is enclosed:

"Compared to all other federal environmental statements reviewed by ROMCOE, the Draft Statement is a superior product. . . . It closes many of the gaps and repairs many of the weaknesses of past oil shale 'impact statements.' It is greatly superior to the 'preliminary draft' of June, 1971. . . ."

"In view of what appears to be a sincere, good faith effort at environmental analysis, it will be extremely difficult for critics to contend with accuracy that the Draft Statement has 'ignored' significant environmental aspects or that the revised statement is 'superficial' or totally inadequate' as some have already charged."

"The analysis of energy alternatives is one of the most complete and thorough reviewed by ROMCOE. It responds to much of the criticism of the Atomic Energy Commission. . in the famous Calvert Cliffs case and obeys the (CEQ) guidelines mandate to conduct a rigorous exploration and objective evaluation of alternative actions that might avoid all or some of the adverse environmental effects."

The ROMCOE critical review also analyzes deficiencies in the Draft Statement and suggests how it can be improved in the

8-46352

The Honorable Rogers C. B. Morton  
October 10, 1972

Page Two

following areas: preparation of an "ecological statement" to integrate segregated information; more intensive analysis of land use and off-site impact; more realistic projection of the impacts of a "mature" industry; much more intensive analysis of water supply and water quality; and a more realistic appraisal of oil shale's relation to the total petroleum supply picture.

We hope that our analysis will contribute to an even more improved Final Statement. In this regard, we urge that the Final Statement not be closed until completion of the joint Interior-industry-Colorado \$750,000 environmental study now underway.

Kindest personal regards,

ROCKY MOUNTAIN CENTER ON ENVIRONMENT



Roger P. Hansen  
Executive Director

RPH:eps

Enclosure

cc: Russell E. Train, Chairman, Council on Environmental Quality  
Dr. Beatrice E. Willard, Council on Environmental Quality  
Nathaniel P. Reed, Assistant Secretary of Interior  
Senator Gordon L. Allott, Colorado  
Governor John A. Love, Colorado  
Governor Stanley K. Hathaway, Wyoming  
Governor Calvin L. Rampton, Utah  
Reid Stone, Oil Shale Task Force  
Thomas W. Ten Eyck, Colorado Department of Natural Resources



CRITICAL REVIEW

DRAFT  
ENVIRONMENTAL STATEMENT  
for the  
PROPOSED PROTOTYPE  
OIL SHALE LEASING PROGRAM

of the  
U.S. DEPARTMENT OF THE INTERIOR  
SEPTEMBER, 1972

by

the  
ROCKY MOUNTAIN CENTER ON ENVIRONMENT  
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October 4, 1972

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4260 East Evans Avenue  
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October 4, 1972

## CRITICAL REVIEW

of the

DRAFT

### ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

#### Introduction

The Department of the Interior, the State of Colorado, and, to a lesser degree, the states of Wyoming and Utah have flashed the spotlight of environmental analysis on a prospective oil shale development program for several years. Collectively, they have expended or are in the process of expending hundreds of thousands of dollars on detailed studies of the anticipated "environmental impact" of oil shale mining, retorting, transporting and related industrial activities. These environmental studies have now passed four significant milestones:

- (1) *Report on Economics of Environmental Protection for a Federal Oil Shale Leasing Program.* Prepared by a special committee of the Governor's Oil Shale Advisory Committee and submitted to Colorado Governor John A. Love January 22, 1971. This report was reviewed by ROMCOE March 1, 1971.
- (2) *Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program* issued by the Department of the Interior, June, 1971, together with a "program statement" and related environmental reports prepared by the states of Colorado, Wyoming and Utah. (Some refer to this Interior statement as a "preliminary draft.")
- (3) Design and contracting in July, 1972 of a two-year, \$750,000 study jointly funded by Interior, the State of Colorado and private industry on: (a) revegetation and surface rehabilitation; (b) environmental inventory and impact; (c) water resources management; and (d) regional development and land use planning ("off-site impact").
- (4) *Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program* issued by the Department of the Interior, September, 1972. It is this "revised" statement that is now under review.

Particular deficiencies have been noted by various reviewers in all of the environmental analyses completed prior to the revised Draft Statement. These include but are not limited to:

- (a) Basing most studies on the presumption that an oil shale industry must, can and will be developed in the near future to meet the "energy crisis."
- (b) Inadequate attention to the "cumulative" environmental impacts of both a fully developed prototype program and a mature industry.

- (c) Tendency to minimize environmental impacts or to assume that most impacts can be controlled to meet both economic and environmental requirements.
- (d) Failure to either consider or adequately analyze the effects of an oil shale industry on salinity and other water quality degradation of the Lower Colorado River Basin.
- (e) Inadequate inventory of environmental resources to be impacted, and the significance of these impacts.
- (f) Inadequate analysis of the "off-site" effects on land use patterns and surrounding communities.
- (g) Failure to make a thorough analysis of possible alternatives to either a present oil shale industry or to the proposed prototype leasing program.

While the revised Draft Statement does not sufficiently respond to each of these deficiencies, it is at least responsive to past criticism. In view of what appears to be a sincere, good faith effort at environmental analysis, it will be extremely difficult for critics to contend with accuracy that the Draft Statement has "ignored" significant environmental aspects or that the revised statement is "superficial" or "totally inadequate" as some have already charged.

The purpose of this review is to identify areas of weakness and inadequacy in the analysis and suggest how the Final Statement might be improved. It is not merely to point out all of the "positive" aspects of what is admittedly an unusual and commendable effort at environmental impact analysis.

This review represents a technical critique and analysis of an environmental statement requested as a ROMCOE service by the Department of the Interior. It is not to be interpreted as a ROMCOE "position" with respect to the question: should or should not oil shale be developed as an energy resource? The review does not purport to represent all environmental viewpoints or even most of them. But perhaps it will provide some indicators as to the types of environmental questions that will continue to be asked about prospective oil shale development.

### COMMENTS:

Environmental Resources Inventory and Analysis. Compared to all other federal environmental statements reviewed by ROMCOE, the Draft Statement is a *superior* product in this respect. It closes many of the gaps and repairs many of the weaknesses of past oil shale "impact statements." It is greatly superior to the "preliminary draft" of June, 1971 (which was probably made "preliminary" only after it was resoundingly criticized for its inadequacy). In particular, the statement is strong in:

- (a) Environmental Resources Inventory -- Although the depth of information varies greatly, the following resources are considered for the over-all program and for every lease site in three states: physiography; climate; geology; mineral resources; water resources; wildlife; fishery; soils; plant life; aesthetic resources; recreation resources; socio-economic resources; ownership patterns; and land use. As might be expected, geology has the greatest depth of information available.
- (b) Cumulative Impact -- Recognition that there are *cumulative* environmental impacts with a snow-balling effect is commendable. While this analysis is inadequate for a "mature" industry projection, it is a significant improvement over previous statements.

- (c) Less Minimization of Impact -- There is much less of a tendency in this Draft to use various editorial devices to understate or minimize possible environmental impacts. There is far less use of qualifiers like "only," "insignificant," "no anticipated effect," "to a minor degree," etc. that color so many federal environmental statements prepared by program proponents.

With all of these considerable and significant improvements, there are still some shortcomings which should be corrected in the Final Statement:

- (a) Better Inventory Information. The major weakness of almost all environmental statements prepared by all agencies of the federal government is that they do not adequately describe the *environment* proposed to be impacted. This is due in part to a weakness of both NEPA and the CEQ Guidelines which call for a "description of the proposed action" followed by an analysis of "probable impact." To make a valid *impact* analysis this Draft needs much more in depth information in the following areas:

climate -- as relating to physiography and the air pollution basic potential. This information is extremely sketchy.

wildlife -- as relating to other impacts of wildlife browse, air pollution, water table drawdown and human population pressures. Information on mule deer heavily outweighs that on other mammals and birds, including possible endangered species.

fishery -- as relating to possible stream degradation from many sources and water table drawdown. Present fishery data is sketchy to non-existent for some sites.

vegetation -- as relating to wildlife browse and cattle forage. Exhaustive lists of species are helpful but a better ecological statement needs to be made.

- (b) An Ecological Statement. Inventory data on environmental components cannot be collected and analyzed in a vacuum. Ecology is a holistic science -- everything affects everything else. The Draft makes no attempt to deny certain significant environmental impacts: "resources... altered irreversibly"; "changes in the relief of the terrain"; "modification of wildlife habitat"; "changes in existing recreation, aesthetic and cultural values"; "degradation" of clean air; "depletion of the Colorado River system"; etc. Some possible environmental degradations may in fact be overstated. However, *the effects of each alteration on the oil shale regional ecosystem must be analyzed as thoroughly as possible.* For example, "fugitive dust" may destroy certain plant species which in turn may affect wildlife browse, hydrologic patterns and erosion. These ecological "triggering" mechanisms are not analyzed to any significant degree in the Draft Statement.

2. Land Use and Off-Site Impact. Along with the failure to adequately project the environmental consequences of a mature oil shale industry, insufficient land use and "off-site impact" analysis is another major deficiency of the Draft. First, "land use" is interpreted in the Draft almost exclusively in

terms of types of uses; the character and environmental dimensions of such uses are generally omitted. Second, and more importantly, only passing references are made to the status of *land use planning and control* in counties and communities of the oil shale region. If the reader is equipped with a fine-tooth editorial comb, he can find statements like this:

- "In at least two states. . . zoning and subdivision regulations are already in effect which, if properly administered, can ensure orderly physical growth and development." (1-111-84)
- "(Housing inadequacy). . . could result in 'shanty town' type development; however, the regulations the planning commission have established will probably avert this development." (1-111-85)

Thus while it cannot be said that off-site impacts are "ignored" in the statement, much more analysis will be needed for the Final Statement in at least the following areas:

- present and projected legal and institutional arrangements for land use planning and land use control in the oil shale region;
- population projections based on incremental increases in oil shale development up to a mature industry the year 2000;
- analysis of possible triggering of related or peripheral industrial developments, e.g., refining, petrochemical, power generation, etc.;
- effects of incremental development on community needs and services, e.g., transportation, sewer, water, police, fire, hospital, schools, etc.;
- effects of increased human pressures on aesthetic, recreational and wildlife resources;
- suggested legal, institutional or other measures to mitigate possible adverse off-site impacts.

Many of the deficiencies in the areas of environmental resources inventory and off-site impact analysis can be corrected *for Colorado* as a result of the Colorado-Interior-Industry \$750,000 two-year environmental study now underway *providing that the Final Statement is delayed until the results of that study are available.* A "rush" Final Statement will not benefit from this detailed information. Wyoming and Utah of course present different problems although some of the Colorado information can be extrapolated for the other two states. The ideal would be to structure similar studies for Wyoming and Utah.

3. Mature Industry Impact. Volume I of the Draft discusses the environmental impact of oil shale development "to a maximum cumulative production of 1 million barrels per day by 1985." (1-1-2) From all indications in the Draft, the "magic million" of production is based strictly on the prototype leasing program for six tracts of 5,200 acres each or 20,800 acres. It is not based on the *ultimate potential* development of 16 million acres of which 11 million acres are believed to be presently valuable for commercial development. Thus

the proposed prototype program represents at the most only about 0.2%, in land area, of the best commercial lands in Colorado, Wyoming and Utah.

In potential production, another magic number is the 600 billion barrels of shale oil believed to inhabit the Green River Formation in deposits at least 10 feet thick and averaging at least 25 gallons per ton. On the high side, 50% of this resource is believed recoverable. In addition, there are believed to be 1,200 billion barrels in "lower grade" zones (15-25 gallons per ton). "The known parts of the oil shale deposits. . . contain a total of at least 1,800 billion barrels. . . ." (1-11-9). Thus the potential long-range recoverable reserve may range from 300 to 900 billion barrels. The development time table seems to be:

by 1980 -- 300,000 barrels/day  
by 1985 -- 1,000,000 barrels/day

annual additions after 1980 -- 100,000 to 200,000 barrels/day

The Draft states: "Estimates of the ultimate size of the industry based upon water availability range from 3 to 5 million daily barrels of shale oil." (Emphasis added.) (1-111-2)

The most conservative analysis of these and related "guestimates" throughout the Draft report lead to these conclusions:

- (1) A mature oil shale industry could be *3 to 5 times* the size of the prototype program for which the environmental statement was prepared; development will not cease in 1985.
- (2) Given unlimited or greatly increased water supplies, the development of the best "commercial" 11 million acres would be over 500 times as extensive, in public land area utilization, as the prototype program. (Although the availability of such a water supply is not realistic, a mature industry even 25 times the size in public land commitment as the prototype program would be highly significant.)
- (3) The Draft Environmental Statement is inadequate in terms of analysis of possible environmental impacts of a *mature industry* which would be "triggered" by the prototype leasing program.

The failure to project the possible environmental consequences of the prototype leasing program into the future of a mature oil shale industry after 1985 is a major shortcoming of a generally excellent environmental analysis. Such a projection is particularly critical for: waste disposal; land utilization; water quality; air quality; and off-site urbanization. An interesting but perhaps unanswerable dimension to the projection of impact of a mature industry is this question: at what point would other aspects of oil production, including refining and petrochemical manufacture become economically attractive? At what level of oil shale development would other industries be attracted by a "cheap" supply of petroleum? The "industrial development fallout" effect has not been examined at all.

4. Water Supply. The Draft recognizes that water availability is one of three primary constraints on oil shale development, along with state of technology and resource availability. (111-1) A fourth constraint of course is environmental quality requirements. Attempting to sort out the complexities of

water availability in terms of quality requirements and sources from the Draft is like trying to segregate all the bean sprouts from a bowl of chop suey. The Draft states: "...ample water is available to support the 1 million barrels daily production rate. Estimates of the ultimate size of the industry based upon water availability range from 3 to 5 million daily barrels of shale oil." (Emphasis added.) (I-III-2) The matter of water for the ultimate size of the oil shale development should be discussed in detail in the Environmental Statement.

The Draft Statement contains a number of facts and figures concerning water requirements and availability.

Surface Water: The statement estimates that water presently available, water which could be made available, and water which will result from "augmentation projects" (weather modification, desalinization and "other methods") could produce the following:

Colorado:	547,000 acre-feet per year	
Utah:	279,000 acre-feet per year	
Wyoming:	162,000 acre-feet per year	(I-II-22)

Reservoirs: In Colorado, the water will come from the existing Green Mountain and Ruedi Reservoirs, the authorized West Divide Project, and the Yellow Jacket, Rio Blanco, and Sweetbriar Projects "when and if completed." (I-II-72) Additional water "might be developed in the Colorado River above DeBewue." (I-II-72) In Utah, water will come from Flaming Gorge (existing) and "potential sites" on the White and Yampa. (I-II-110) Wyoming will look to Flaming Gorge and Fontenelle, with additional supplies by "purchasing and changing the nature of use and point of diversion" of existing rights. (I-II-149)

Estimated water needs range from 4,960-7,730 acre-feet per year for a 50,000 barrel per day operation to 79,300-124,000 acre-feet per year for a million barrel per day industry. Of these requirements, less than half are for "high quality" water. These figures are for *consumptive* use only, and do not include needs for water to be returned to the stream. Nor do they include provision for revegetation water.

Groundwater: The unknown quality and quantity of the groundwater is discussed in the statement. It is anticipated that water will be encountered in the mining operations, and that in Colorado, this water will make a significant contribution to the process needs. The hypothetical mine water balances laid out on page I-III-35 show that water from surface mines may exceed water requirements (including high quality water). From underground mines it could come close to meeting requirements. This calculation is based on a number of assumptions the authors term "reasonable."

Several problems are inherent in the discussion of water in the Draft:

In the first place, the sources of supply are fraught with uncertainty: Most of the impoundment and diversion projects anticipated in the statement are not yet constructed. Controversy surrounds their approval. A possible problem in getting their approval is the questionable legality of Bureau of Reclamation projects intended primarily to supply industry

rather than agriculture. In addition, there is the requirement that projects be primarily (70%) to supply present needs (43 USC Sec 390 [b]).

Another aspect of uncertainty is the "augmentation" program. The environmental impact of the suggested methods has not been adequately analyzed, nor has the potential for success in augmentation of flow.

Groundwater quantity and quality is clearly an unknown, despite the calculations of mine water in two hypothetical mines in Colorado. The assumption that half of the water encountered would be of high quality (I-III-35) is not documented, nor is there any assurance that the right amount of the right quality of water would be available at the right time. The industry will require a *stable supply* of high quality water.

Depletion of the groundwater will also be significant. Even if the "hypothetical" situation held true initially, it could not be expected to endure. And, as the statement says, only Colorado can expect to get very much water from the ground. In addition, the relationship between ground and surface water is not adequately analyzed.

However, the main deficiency of the statement with regard to water is not whether there is *enough* water to supply the industry at a given level of development. It is, rather, *what will be the environmental effects of supplying vast quantities of water to oil shale development?* Even if ample quantities of water were assured, the necessities of "developing" the surface water and depleting the groundwater have to be evaluated as ecological problems. There has been no attempt to do so in the Draft Statement. A statement such as "Thus, consumptive use of water for oil shale development could increase the salinity by 1.4%" (I-III-39) should be the beginning of analysis rather than the end. What will this increase in salinity mean to downstream users, to Mexican treaty obligations, and other considerations?

Similarly, the question "what will this mean?" must be asked at every point in the discussion of water for the oil shale industry. The Final Impact Statement must examine these questions.

In addition, the Final Statement should present in *clear form* where it is expected that each acre-foot of water will come from, and when. The information is scattered throughout the Draft Statement, and not set out with enough specificity. The Final Statement should also include an examination of two types of water needs which were omitted in the draft: water used but not consumed in the process, and water needed for revegetation.

In the analysis of the specific tracts, water needs and availability must be set out with the same clarity and completeness requested for the overall analysis. The environmental effects of this water development must also be set out for each tract.

Thorough minimum stream flow studies should be completed, and the effects of diminished flows on biota, recreation and aesthetics and water quality must be detailed.



In discussing disbenefits of oil shale development, the potential uses of the water for other purposes should be examined. Water used for oil shale will not be available for other uses, such as agriculture and recreation; hence, benefits will be transferred to oil shale from another sector and will be foregone by that sector.

The salinity problem of the Colorado River merits considerable discussion. Cumulative effects of diversions, reservoir evaporative losses, and new sources of mineral loading are significant. The oil shale consumptive use should be combined with diversion of 108,000 acre-feet to the Missouri Basin as proposed in the Wyoming-Montana Aqueduct Study, 330,000 acre-feet to the Great Basin from the Green River drainage in the Central Utah, and several 100,000 acre-feet of proposed transmountain diversions in Colorado. The total impact, especially in low-flow years (the flow averages over 14,000,000 acre-feet, but has been as low as 6,000,000 acre-feet), should be discussed.

Alternatives to high elevation dams should be considered. The environmental impact of dams such as Yellow Jacket would probably be more significant than that of possible dams at lower elevations.

The Final Statement should analyze not only the impact of the proposed dams, but assess the other options for securing water. Analysis of the options for water diversions is lacking in the Draft.

5. Alternatives. The analysis of energy alternatives is one of the most complete and thorough reviewed by ROMCOE. It responds to much of the criticism of the Atomic Energy Commission on the examination of alternatives in the famous *Calvert Cliffs* case and obeys the Council on Environmental Quality guidelines mandate to conduct a "rigorous exploration and objective evaluation of alternative actions that might avoid all or some of the adverse environmental effects." (CEQ Guidelines Sec. 6 [iv]) While some will not agree with the reasons for an apparent rejection of certain alternative energy resources, they could not responsibly call the alternatives volume "superficial" or "inadequate."

Twenty-two separate alternative energy sources are examined in greater or lesser detail including such exotic sources as magnetohydrodynamics (MHD), fuel cells, wind energy, tidal energy and thermionic generation. Also, in greater or lesser detail, the environmental impact of each alternative is examined.

Nevertheless, there are several problem areas that should be examined more closely in the Final Statement:

- the statement authors seem overzealous in rejecting many of the alternatives on the basis of adverse environmental impacts. In fact, some of the contemplated environmental horrors from alternatives to oil shale seem overstated. This seems particularly true of environmental analyses for off-shore drilling, increased conventional production, LNG imports and geothermal energy.
- there is no comparative analysis of the possible environmental effects of the various alternatives, many of which are described as having impacts very similar to those described for oil shale.

- the argument that oil shale is really a necessary and viable alternative to increased on-shore domestic production is not convincing because of statements like these:

"Complete adoption of all recovery methods where applicable to existing oil fields could physically recover nearly 100 billion barrels of oil . . ." (11-41)

"Higher prices and/or improved technology would make it profitable to extract substantial amounts of additional oil from fields which are now economically marginal." (11-41)

"Indeed, the total volume of undiscovered oil and gas in this Nation is expected to equal or surpass the volume that has been discovered from 1859 to the present." (11-43)

"With an ever-increasing amount of supply and a relatively stable wholesale price, the petroleum industry had (in the past) neither the need nor the economic incentive to spend money to develop new oil supplies." (11-35) (Can it be said that this situation remains unchanged today?)

The Draft Statement seems to clearly imply, without stating explicitly, that domestic conventional production could more than make up the petroleum deficit providing necessary adjustments were made in technology, economic incentive, government leasing policies, taxation and price controls.

It is not at all clear why an oil shale industry wouldn't be shackled by some of the same strictly economic problems.

Several points in the "Alternatives" volume bear comment:

- Two things are not clear about the apparent rejection of oil shale development on private lands as opposed to public lands: (1) why only "sufficient interest" in oil shale development on public lands could trigger development on private lands; and (2) why through the enactment of appropriate state and federal legislation the environmental quality control requirements for oil shale development on private lands might not be made the same or similar to those for public lands. This alternative requires a much more thorough analysis in the Final Statement.
- The alternative of delaying development on public lands is rejected by the dubious logic that "prolonged delay may leave no alternative but to react eventually with a crash program to develop this resource." (11-64). Therefore, since crash programs "frequently sacrifice environmental considerations," it is environmentally sound to move ahead now. Paraphrased this seems to mean: "In order to protect the environment in the long run, let's begin disturbing and altering the environment as soon as possible." Aside from a really major catastrophe (and nuclear war won't need oil shale), the Congress need not be stampeded into environmental irresponsibility any more in the future than in the present.

-- The automobile and highway lobbies will continue to minimize the effect of mass transit, smaller vehicles, smaller engines, better urban design or any other device as an alternative to the Detroit gas-hog that wallows in the trough of America's petroleum resources. (11-71)

6. Oil Shale and Petroleum Needs. Aside from the "energy crisis," unreliability of foreign imports, and related arguments, the key rationale for accelerated oil shale development might be summarized in this statement:

Recovery of even a small fraction of this resource would represent a significant energy source adequate to supplement the Nation's oil supply for many decades. (Emphasis added.) (11-1-2-3: 11-53)

In 1970 the U.S. consumed petroleum products at the rate of 14.7 million barrels a day -- 5.3 billion barrels a year. Nevertheless, "precise estimates of future petroleum requirements are difficult"; "beyond 1975 projection becomes increasingly difficult." (11-25) There are just too many unknowns that could swing the petroleum demand curve up or down.

The Draft represents that the U.S. is 1.5 million barrels per day short of meeting its needs with domestic supplies and that this deficit will increase. Thus, production of the magic million daily barrels must get on stream as soon as possible.

But there are some inconsistencies:

- "If the Trans-Alaska pipeline is constructed as proposed, about 2 million barrels per day of oil from Alaska will be available by 1980. While this involves a significant amount of oil, it will only be a fraction of the increase in demand between 1970 and 1980." (Emphasis added.) (11-42) (Oil shale production would be about 300,000 barrels per day by 1980.)
- "Failure to bring oil shale into production would raise dependence on imported oil from a range of from 33 to 41 percent to a range of 37 to 45 percent in 1985." (This is an increase of 4 percent.) (11-85)
- Referring to the alternative of increased conventional "on-shore production": "With an estimated original oil-in-place of 425 billion barrels, an increase of only one percent in the average recovery of oil in place would yield 4.25 billion barrels, or 2 million barrels per day for 12 years." (Emphasis added.) (11-112)

Six hundred billion barrels of oil (estimated commercially recoverable reserves) is a lot of oil, even if only 50% of it is recovered, which seems likely. At least, it is a lot of oil for a little while -- maybe as much as a 60-year domestic supply if consumption levels *remain at 1970 levels* until the year 2032. Exponential growth, the present pattern on the planet, could cut that to 20-30 years almost overnight.

Just how much oil, really, is 1 million barrels per day?

The average automobile carrying commuters to work transports 1.4 people. Considering average commuting distances and number of commuting vehicles, this amounts to a consumption rate of about 2.74 <sup>million</sup> barrels per day. By doubling the occupancy of the average commuting vehicle -- to 2.8 persons per car -- the saving would be 1.37 million barrels a day. This is more than a third in excess of anticipated oil shale production by 1985! Since 56% of all commuting trips carry only one person, picking up one neighbor who usually drives his own car would save .77 million barrels per day -- 3/4 of the daily oil shale production by 1985. Adding two more people who usually drive alone too would save another 2.3 million barrels per day. 1 /

The above analysis has not been for the purpose of downgrading oil shale as a potentially significant national natural resource. It is only to point out that the good old American consumptive ethic -- particularly as manifested in the automotive syndrome -- could soon wipe out all that oil shale might gain.

7. Tract Selections. The number of tracts chosen for the prototype program, the exact sites selected, and the potential environmental impact at the selected sites merit discussion. The impact statement contains the following points:

- Selection process. "The tract selections were based on an evaluation of such factors as the potential for progressive stimulation of technology, resource availability, potential recoverable resource, interest in the area, and sufficiency of data. Many factors were considered during the tract selection process, including groundwater quantity and quality, shale thickness and grade amount of overburden, associated minerals, existing land uses, and competitive interest in various tracts shown by nominating companies." (III-IX-1)
- Number of tracts. "The selection of fewer tracts for development under the prototype program would result in reduced environmental disturbances. This positive consideration, however, would also involve a reduction in the opportunity for competitive development." (III-IX-2) "Selection of a greater number of tracts would permit even broader industry participation and the examination of more of the parameters affecting oil shale development. . . . Attendant with increased development, however, would be an increase in the potential for environmental disturbances." (III-IX-2-3)
- Description of sites. Colorado a: "The area has very significant value for winter as well as spring and fall deer range, and constitutes a wild horse use area. . . . The tract lies on the edge of a relatively remote, undisturbed habitat area managed by the Colorado Division of Game, Fish & Parks for the primary benefit of wildlife species and a broad spectrum of recreational users." (III-II-31) "The Cathedral Bluffs, west of the tract, are an unusual land form. . . . The Bluffs are considered a scenic area. . . ." (III-II-40)

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<sup>1/</sup> These calculations were made from statistics found in:  
Hirst, Eric, *Energy Consumption for Transportation in the U.S.* Oak Ridge National Laboratory; March, 1972.; and

Colorado b: "Tract C-b and the surrounding area have a sizeable mule-deer population." (III-11-55)

Utah a, b: "The tracts are within a mile or so of the White River." (III-11-62) "Proposed test-lease sites Tracts U-a and U-b contain a healthy association of wildlife species. . . . Important eagle (bald and golden) nesting and roosting sites are present along the drainage escarpments. . . ." (III-11-63) "Erosion has produced unusual and interesting scenery on the rugged canyon walls along the White River." (III-11-69)

Wyoming a,b: ". . . a broad variety of wildlife species utilize these tracts. . . ." (III-11-78) "The aesthetics attraction, notably the Kinney Rim escarpment. . . ." (III-11-82) "The Kinney Rim area is in the heart of the historic Wind River Shoshone and Comanche country." (III-11-83)

It is clear from the above statements that the chosen tracts have significant environmental value, but that considerations of competitive value and technological factors were the major parameters in selecting the sites. Recognition of certain environmental imperatives would almost certainly have dictated different selections. As Glen Weaver states: "Examination of the tract locations reveals that two embrace lands forming the scarp and dip slopes of Kinney Rim in Wyoming, two border the White River in Utah, and two lie within Colorado's Piceance Creek Basin mule deer winter range. All six tracts would seem to be poor choices for minimizing environmental impacts."

The discussion of the number of tracts does not seem to justify six as a "magic number," to structure a perfect balance between environmental damage and experimental opportunity. It is likely that six tracts, two in each state, is politically symmetrical, and that this must be an important consideration.

It is clear that environmental damage will increase in proportion to the amount of development. Therefore, the number of tracts should be chosen in conjunction with a very careful analysis of the anticipated environmental damage. The impact statement gives no such evidence to back up the choice of the number, the location or the number in each state.

The role of development on private lands is not explicitly discussed. The impact statement refers to a target level of 1 million barrels per day production by 1985 without further leasing. A maximum production from the six sites is established at 250,000 barrels per day on page III-VI-3. Does this mean that 3/4 of the total (750,000 barrels per day) will be produced on private land, compared to only 1/4 (250,000 barrels) on the six public tracts? (III-VI-3)

If the answer to this question is in the affirmative, it would seem that additional justification is needed for leasing public lands at this stage. It is true that the prototype program will offer more of an opportunity for direct control by the Government, through the lease terms, but the impact statement does discuss alternative types of control.

The final impact statement should address the question of development on private lands, and reassess the desirability of the prototype program in that perspective.

The Draft Statement is also deficient in analyzing the anticipated environmental impacts on the particular sites. For example, there is no attempt to predict an air pollution model for any of the tracts. In fact, air pollution and noise are given only 2 1/2 pages in volume III. Nor is there an effort to be specific about the predicted damage to wildlife habitat, water depletion, etc. An environmental impact statement should discuss the magnitude and implications of environmental damage to the maximum extent possible. To simply state there will be an effect of one sort or another is not enough. Just as in the analysis of the industry as a whole, neither of these objectives is achieved in the discussion of the specific tracts.

The Final Statement should include such an impact analysis.

In addition, reconsideration should be given in the Final Statement to both the number of tracts and the nature of the specific tracts chosen.

8. Lease terms and stipulations. There are several stipulations in the lease which relate to environmental problems, and which should be considered here:

- It is stated that the stipulations of the lease "may be revised or amended by mutual consent of the Mining Supervisor and the Lessee at any time to adjust to changed conditions or to correct an oversight." (III-V-45)
- Monitoring. "The Lessee shall prepare. . .and. . .conduct an environmental monitoring program. . . ." (III-V-46)
- "Lessee shall provide for briefings on environmental and other pertinent matters for supervisory personnel by such Federal and State employees as may be designated by the Mining Supervisor." (III-V-47)
- "The Lessee shall not use pesticides and herbicides without the approval of the Mining Supervisor." (III-V-61)
- "All construction activities, exclusive of actual mining activities, that may cause the creation of new lakes, drainage of existing ponds, diversion of natural drainages, alteration of stream hydraulics, disturbance of areas of stream beds or degradation of land and water quality or adversely affect the environmental integrity of the area are prohibited unless approved in writing by the Mining Supervisor." (III-V-63) (Emphasis added.)

The above excerpts present important problems which recur throughout the stipulations of the lease. Most important of these:

- the problem of the regulated regulating himself, (the lessee runs his own environmental monitoring program)
- broad discretion concentrated in the Mining Supervisor: He has the authority to waive various environmental safeguards. He, with the Lessee, can in effect change the stipulations of the lease.

These are worrisome provisions. The environmental implications could be very significant, and should be explored in the Final Statement.

9. The "Unknowns." As the Draft Statement freely admits, efforts to make competent environmental impact analyses are faced with a huge knowledge gap. Some of these gaps will be filled by the Colorado Study, some will require many more years of research and, to the consternation of some environmentalists, some information will become available only as a result of oil shale development. There is simply a limit on the ability to make accurate and defensible environmental impact predictions based solely on hypothetical situations. While the Colony and Anvil Points "pilot" operations have produced much useful information, some of it is protected by confidentiality requirements of the Securities and Exchange Commission and companies involved. Also, these operations have not produced information on some types of underground mining, surface mining or in situ processing. Here are just a few of the unknowns:

- unknown feasibility of successful revegetation programs covering large areas characterized by long regeneration time; (I-I-44)
- unknown effects of saline water disposal; (I-I-54)
- unknown amounts and quality of groundwater that will be encountered from ground, surface or insitu mining; (I-I-54)
- unknown degree of surface subsidence that may result from certain mining operations; (I-I-56)
- unknown wildlife and fishery data in many parts of the oil shale region; (numerous references)
- unknown water quality characteristics in many parts of the region; (numerous references)
- unknown historical and/or archeological information in most parts of the region; (numerous references)
- unknown amount of water that may be available from mining for oil shale operations; (see discussion in "Water Supply" section)
- unknown meteorological data to describe air pollution dispersion and inversion conditions in Wyoming; (I-III-53)
- unknown conditions required for re-establishment of indigenous wildlife food and cover plant species; (I-III-55)
- unknown amount of erosion that might result from areas stripped of natural cover; (I-III-56)
- unknown possible impacts on aquatic plants and animals that could result from water quality degradation from sediment, leached substances and saline groundwater; (I-III-57)
- unknown and "presently unquantifiable" adverse impacts upon fish and wildlife that could be triggered by urbanization associated with oil shale development; (I-III-59)
- unknown potential for health and safety hazards to oil shale industry workers; (I-III-86)

- unknown environmental impacts of water diversions, dams and reservoirs -- on-site and off-site -- which will be needed for oil shale water supplies. (1-V-3)

These are just a few of the unknowns that can be quickly referenced. Some of the other unknowns like kind and intensity of urbanization and industrialization, ecological consequences (not merely environmental), and effects of a mature industry have been covered above. While it might be unreasonable to expect that oil shale development would be postponed until all of the unknowns were known, this question presents itself: *after how many "unknowns in critical areas do the risks begin to possibly outweigh the benefits?*

### Conclusion

As has been pointed out previously, this Draft Environmental Statement is considerably superior to all of its state and federal government predecessors in its description of the environment, description of possible impacts and analysis of alternatives. Perhaps it is unavoidable, in part, that these areas of the statement are deficient in information and/or analysis:

- water supply for either a 1 million barrel per day or a mature industry in terms of both quantity and quality;
- on-site and off-site impact of a mature industry;
- environmental impact analysis with respect to *significance* of environmental impacts and structuring of an ecological statement;
- land use planning and control and off-site impact;
- contribution of oil shale, short-range and long-range, to the total petroleum supply picture;
- criteria for and environmental analysis of tract selections;
- conventional petroleum production and private oil shale development as alternatives to public leasing.

It is anticipated that many of these gaps will be closed in the Final Statement. However, this makes it all the more critical that the Final Statement not be closed until the Colorado oil shale environmental study has been completed.



**Rocky Mountain Sportsman Federation**P.O. BOX 52  
WESTMINSTER, COLORADO 80030Grand Junction, Colorado  
November 4, 1972

Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D.C. 20240

Dear Sir:

After having visited the two proposed prototype oil shale leasing program sites located in the Piciance Creek Basin in western Colorado and after studying the Draft Environmental Impact statement for the proposed prototype oil shale leasing program we have reached these conclusions:

This proposed oil shale development is premature.

Technology is not yet available to develop and produce oil from these oil shale deposits.

If this program were to proceed as scheduled it would be nothing more than a large scale experiment conducted by trial and error and would no doubt result in great unnecessary expense to the oil companies, which would be passed on to the public in the form of higher prices for the oil produced.

By the proposed methods of development the damage to the environment would be prohibitive.

Better methods for development and production must be found.

The proposed methods would cause direct and indirect changes in the environment of the entire oil shale region.

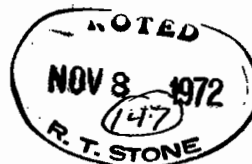
For each proposed development site of approximately 5120 acres the total impact on the environment could affect as much as 30,000 acres or more.

Because of poor soils and low rainfall each year there would at best, be an extremely long, slow process of revegetation.

In the meantime these large areas would be subjected to soil erosion and water siltation in our streams on a much larger scale than we have ever witnessed before.

Because of the poor quality water that would be used in the development and mining process, would then find its way into our streams, our salinity problems would be many times greater than they are now.

Because of previous commitments to provide quality water to the states down stream and Mexico, the citizens of the United States are paying millions of dollars to reduce siltation and salinity in the Colorado River Basin.



November 4, 1972

The impact on grazing, wildlife and recreational use would amount to near total destruction for 25 to 30 years or more.

These proposed oil shale lease sites "CA" and "CB" in the Piciance Basin are in the center of the range of one of the largest mule deer herds in the state. Almost total loss of this deer herd and other wildlife in the area would result. This is an renewable resource and the State of Colorado realizes many thousands of dollars income from this source annually. Who can set a price on the value of this land for recreational use? Its value increases each year because of the greater number of people using it.

We feel that the cart has been placed before the horse and that land use and energy policy studies should be completed before any further development is done.

Respectfully yours,

*Elmer White*

Elmer White, Vice President  
Rocky Mountain Sportsman Federation

EW:st

cc: Carl Bush, President  
File

JORGE E. CASTILLO  
ATTORNEY AND COUNSELOR AT LAW

SUITE 2422 PRUDENTIAL PLAZA  
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DENVER, COLORADO 80202

October 20, 1972

Director, Office Of Hearings and Appeals  
Department of the Interior  
4015 South Wilson Boulevard  
Arlington, Virginia 22203

Dear Sir:

With this letter we are sending you the comments of the Enos Mills Group of the Sierra Club in relation to the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program of the United States Department of the Interior, September, 1972.

Very truly yours,

  
JORGE E. CASTILLO

JEC/sbg  
enclosure

cc: Oil Shale Co-Ordinator  
United States Department of the Interior  
Washington, D. C. 20240

OFFICE OF

OCT 24 1972 (73)

HEARINGS & APPEALS

JORGE E. CASTILLO  
ATTORNEY AND COUNSELOR AT LAW

October 20, 1972

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**Original Signed By**  
**JORGE E. CASTILLO**

JORGE E. CASTILLO

JEC/sbg  
enclosure

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Department of the Interior  
4015 South Wilson Boulevard  
Arlington, Virginia 22203

COMMENTS ON THE DRAFT ENVIRONMENTAL STATEMENT  
FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM  
OF THE UNITED STATES DEPARTMENT OF THE INTERIOR  
SEPTEMBER, 1972

BY

THE ENOS MILLS GROUP OF THE SIERRA CLUB  
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OCTOBER 20, 1972

The Enos Mills Group  
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October 20, 1972

COMMENTS ON THE DRAFT ENVIRONMENTAL STATEMENT  
FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM  
OF THE UNITED STATES DEPARTMENT OF THE INTERIOR  
SEPTEMBER, 1972

1. Introduction.

Because of the vastness of the subject matter and the limited time allowed by the U. S. Department of Interior for the filing of comments to its September, 1972 Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, these comments do not present but a few of the environmental view points bearing upon the proposed oil shale development. We have attempted to identify and briefly comment upon a few areas of inadequacy in the Draft with the hope that such areas may be improved when the Final Statement is issued. We understand that other environmental groups will file comments of their own concerning the sufficiency of the Draft Environmental Statement. Insofar as our comments do not touch upon the same areas discussed in the comments of other groups, we join in the comments by such other groups.

2. Energy Considerations and Alternatives.

Under Section 102 of the National Environmental Policy Act and CEQ Guidelines, Section 6 [iv] of the Interior Department is obligated to conduct a "rigorous exploration and objective evaluation of alternative actions that might avoid all or some of the adverse environmental effects."

The underpinning of the proposed oil shale development is the idea of decreasing the claimed gap that is said to exist between an increasing demand for energy and growing problems of supply. See Volume II, Part I, Page 1 and Part II, Page 4 et seq. Oil shale is proposed as an answer to the so-called "energy gap."

Aside from the fact that the proposed goals of oil shale development in terms of oil production are speculative, the Draft fails to comply with the mandate of Section 102 of the National Environmental Policy Act and the CEQ Guidelines thereunder in its analysis of alternative, "cleaner" energy sources. For example, in view of the admittedly prohibitive environmental costs of the proposed oil shale development, analysis of meaningful, alternative, "cleaner" energy sources would dictate that the Final Statement contain a detailed analysis as to the cost of a crash program to develop solar energy sources to be used in place of or in conjunction with any oil shale development together with a meaningful evaluation of the environmental effects of such "cleaner" energy sources. Mention is made to Volume II, Part V, Section C, Paragraph 10, Section G, Pages 197-198 that

"A massive research and development effort over an extended period of time would be required to lower costs, increase conversion efficiency and to achieve acceptable systems performance."

A meaningful analysis of an alternative energy source requires an in-depth study as to what it will take, in terms of research and development, money and environmental costs, to develop that source. It is only upon the presentation of such a detailed statement that an intelligent decision can be made as to whether or not the cost, in all its phases, of developing solar energy sources justify their rejection especially in view of the admittedly vast environmental damage of oil shale development.

In these comments we use solar energy only as an example of what we consider to be the failure of the Interior Department in its Draft to properly and meaningfully examine the use of alternative, "cleaner" energy sources.

### 3. Environmental Inventory.

The Draft Statement is, we think, deficient in its description of the environment which will be affected in at least the following respects.

A. The information given with respect to climate, as it relates to the physiography and the air pollution basin potential is, at best, wanting in completeness. More in-depth information regarding climate is necessary.

B. By and large the data on fish populations is non-existent so that it is impossible to relate the probable stream degradation and the probable water table drawdown to the fish population and the effects thereon.

C. The effect of the oil shale development as it pertains to wildlife browse and cattle forage is impossible to ascertain. More in-depth information concerning wildlife browse and cattle forage is necessary.

D. The effect of air pollution, lowering of the water table, and human population pressures upon wildlife browse is not ascertainable from the Draft because the information on the wildlife affected is meager.

#### 4. Impact Outside of the Area Involved in the Development.

The Draft Statement fails to adequately analyze the impact of the proposed oil shale development upon areas outside of the development area. The Draft Statement fails to cover and analyze.

A. Present machinery for land use planning and control in the areas effected by the oil shale development and what steps will be necessary to enable it to cope with the oil-shale connected problems.

B. The population pressures which will develop when the proposed industry acquires a mature status.

C. The effect of industrial developments connected with the oil shale development (for example, power generation).

D. Consequences of the proposed development on the ability of the local communities to provide such services as transportation, schools, sewers, etc.

E. Any proposed steps to ameliorate the impact of oil shale development in areas outside of the development area proper.

#### 5. Water Supply.

The estimate of the water needs for the proposed oil shale development ranges from 5,000-7,700 acre-feet per year for a 50,000 barrel per day operation to around 80,000-124,000 acre-feet for a 1,000,000 per day operation. These figures do not include provision for the water to be used in re-vegetating. Nowhere in the statement does one find a discussion of the environmental effects of supplying the great quantities of water projected for the oil shale development. Assuming that the projected water needs can be



met, it is imperative that the effect of ground water depletion and added pressures upon surface water be evaluated in terms not only of the impact on the environment but also upon agriculture.

It is difficult to ascertain from reading the Draft where the projected water needs for oil shale development will come from. It seems that the final version of the statement should be revamped so as to set forth with clarity the sources of the needed water.

#### 6. Tract Selection.

In general, it appears that there is no substantial environmental considerations that justify the selection of six tracts for the prototype program. One would think that the number of tracts ought to be selected after a very careful analysis of the anticipated environmental harm.

The Draft Statement should address itself to the development of a prototype program on private lands and should examine the desirability of a prototype program there.

#### 7. Lease Terms.

At least two areas in the proposed lease terms are the source of concern: The stipulation that the lessee shall run his own monitoring program and the broad discretion given to the Mining Supervisor which, in substance, allows him, in conjunction with the lessee, to effectively change the terms of the lease.

#### 8. Matters Which Remain Undetermined.

Throughout the Draft Statement there is a plethora of unknowns that would dictate postponement of the development until substantially all of them are resolved. Among these are the following

A. Erosion resulting from areas stripped of their natural cover. Volume I, Part III, Page 56.

B. The effect upon aquatic plants and animals resulting from saline ground water, leaching and water quality degradation. Volume I, Part III, Page 57.

C. What is referred to as the "presently unquantifiable" adverse effect upon fish and wildlife triggered by increased urbanisation associated with oil shale development. Volume I, Part III, Page 59.

D. The health and safety hazards potential to workers in the oil shale industry. Volume I, Part III, Page 86.

E. The unknown environmental effect of water diversions, dams, and reservoirs in and around the development area in connection with supplying water for oil shale development.

F. The effects of salt water disposal. Volume I, Part I, Page 54.

G. The feasibility of successful re-vegetation over large areas.

H. The requirements for re-establishing indigenous wildlife food and cover plant species.

2169 Sherman Avenue  
Salt Lake City, Utah 84108  
November 5, 1972

Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
40145 Villa Boulevard  
Arlington, Virginia 22203



Dear Mr. Day:

We in the Uinta Chapter of the Sierra Club, with some 800 members in the state of Utah, are greatly concerned about the possible environmental effects of the proposed oil shale leasing program for eastern Utah and nearby states. If the public questions and criticisms raised at the October public hearing in Salt Lake City on this program were bland, it was because the public has been given so little information on which to make an informed evaluation. Moreover, the Draft Environmental Statement issued by the Department of Interior in September of this year leaves several important questions only partially answered. For example, what are the likely cumulative environmental consequences of a mature oil shale industry in the region? What is the status of land use planning and control in the counties and communities of the oil shale region? What would be likely off-site impacts of the program? What are possible alternatives to the proposed leasing program?

Such basic questions as these should be carefully answered before any decision is taken on the leasing issue. The first step, therefore, should be to make a more thorough environmental impact study and analysis of the proposed oil shale leasing program. We further urge that once such a complete study is made, that it be widely publicized so that the public can educate themselves concerning the questions involved and make an intelligent decision on the matter.

We urge, second, that if or as some leasing proceeds, that responsible authorities continue to review each separate project individually for its own merits, rather than review the entire program as a unitary whole. This procedure, we believe, will permit a more effective, accurate review process and provide better insurance against the possibility that damaging and even irreparable errors and decisions might be made.

Please include this letter in the official hearing record.

OFFICE OF

NOV 9 1972

HEARINGS & APPEALS

Yours truly,

*Sara Michl*

Sara Michl  
Land Use Chairman  
Sierra Club, Uinta Chapter



# Telefax

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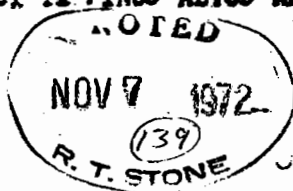
THE SECRETARY OF THE DEPT OF INTERIOR

WAS HDC

LETTER NO. 46

I WISH TO EXPRESS OUR OBJECTION TO THE OIL SHALE PLAN THERE  
ARE SERIOUS QUESTIONS AS TO THE DEPTH AND DEGREE OF ENVIRONMENTAL  
IMPACT INDUSTRY WOULD RATE THE ENVIRONMENT FOR PROFIT THEN THE  
AMERICAN TAX PAYER WOULD PAY THE BILL IN THE 100 BILLIONS IN A  
CORRECTIVE ACTION IS THIS GOVERNMENT ECONOMY? IS THIS  
ECOLOGICAL PLANNING? IS THIS A CURIOUS EXPRESSION OF LOVE FOR  
COUNTRY

NORMAN G. JETTE PRESIDENT SOUTHWESTERN NMEX AUDUBON SOCIETY  
PO BOX 12 PINOS ALTOS NMEX 88055



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Robert Weaver, Executive Director  
Colorado Council, Trout Unlimited

LETTER NO. 47

November 6, 1972

OFFICE OF

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HEARINGS & APPEALS

U. S. Department of Interior  
Mr. James M. Day, Director  
Office of Hearings & Appeals  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Re: Trout Unlimited Comments on the Draft Environmental Statement For  
The Proposed Prototype Oil Shale Leasing Program

Dear Mr. Day:

Thank you for the opportunity to comment on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program. Please include this statement along with the Colorado Council's statement (enclosed) in the official hearing record.

Trout Unlimited is a national conservation organization with 15,000 members dedicated to the protection and improvement of our cold water fisheries, fisheries habitat and water resources. Trout Unlimited has not taken a position either for or against future oil shale development. Our comments are intended to identify what we feel are deficiencies in the Draft in the areas of water and fisheries and are not to be interpreted as a Trout Unlimited "position" on oil shale development.

The draft is inadequate in providing sufficient information and analysis in regard to water requirements, water resources, water supply sources and fisheries.

Water Requirements: The Draft estimates water requirements of a million barrel per day industry at 79,300 - 124,000 acre feet per year; but this is for consumptive use only and does not include water that would be returned to the streams, water required for revegetation and municipal needs for population increases.

Water Resources and Supply: The Draft estimates the amounts of surface water that is presently available, that could be made available, and that could be made available through augmentation projects (i.e. weather modification). However, water supply from projects like Yellow Jacket, West Divide, Rio Blanco and Sweetbriar (when and if completed) is uncertain due to the controversy

U. S. Department of Interior  
November 6, 1972  
Page 2

surrounding their approval. Trout Unlimited is opposed to old fashioned water development projects like Yellow Jacket which construct high country, fluxuation reservoirs and miles of canals seriously damaging entire watersheds and wildlife habitat. We believe that this is the wrong approach to supplying water for oil shale and suggest that alternatives for supplying water be more thoroughly investigated, (i.e. take the water out of the White River below Meeker). Furthermore, we question the legal authority of the Bureau of Reclamation to build projects like Yellow Jacket which are primarily for industrial purposes. The Bureau is charged with building projects which are primarily for irrigation.

The supply from augmentation programs is also uncertain due to the questionable degree of success and the unknown environmental impact of suggested augmentation methods.

The information in the Draft on the quantity and quality of ground water is not adequate to predict the usable supply or the environmental impact of oil shale development. This is evidenced by frequent use of phrases such as "data are not available", "it is not presently known", and "the Uinta formation yields water that range in quality from fresh to briny. Few data are available on well yields". The relationship between ground water and surface water must also be more thoroughly investigated.

Fisheries: The Draft information on fisheries is not sufficient for a complete analysis of how fisheries will be effected. According to the Draft, "Little systematic investigation of the Colorado River basin fisheries has taken place since 1900 and the status of many species is not known. Existing information indicates that the region has retained a large number of native species unique to this area. Several of these may soon be classified as rare or endangered." Obviously, more fishery data will be needed for an adequate analysis of impacts.

The draft does contain a brief inventory of fishable waters existing in 1965 in the Upper Colorado Region. Most of these fishing waters are outside the oil shale areas. We believe that these fisheries will be damaged much more than the Draft indicates, especially, if the water is supplied by high country water development projects like Yellow Jacket, West Divide, Rio Blanco and Sweetbriar. The Draft does not analyze how these water development projects will affect fisheries.

The oil shale and water development would open new roads and trails which would increase access to relatively undeveloped areas. This increased access along with oil shale related population growth would result in considerable increased pressures on fish and wildlife. The effects of this are not adequately analyzed in the Draft. This increased access and urbanization will also create a wide range of fish and wildlife management problems which should be more thoroughly evaluated in the final environmental statement.

To what extent will fisheries be damaged by decreased water quality? The Draft mentions sources of possible and probable water pollution: siltation, salinization, accidental spills, disposal of poor quality ground water, organic and nutrient loading of surface and ground water, algae bloom and oxygen deficiency from concentrated population, industrial, etc. It is suggested that much water pollution could be avoided through use of a wide range of waste treatment methods. However, the environmental impacts of decreased water quality cannot be evaluated until it is known to what extent these waste treatment methods will be utilized. What guarantee is there that this "wide range of waste treatment methods" will be implemented?

Mine dewatering and ground water withdrawal would cause decreasing ground water levels and artesian pressures of aquifers which could dry up some springs and reduce surface stream flows. The Draft states that this would result in changes in the natural plant-animal complex associated with each particular water feature and related wildlife. Existing water rights could also be intercepted. This, along with oil shale water development, would further decrease stream flows. Hopefully, the final environmental statement will analyze more thoroughly the extent and impacts of dewatering.

Irreversible and Irretrievable Commitment of Resources. Oil shale development would result in irretrievable commitment of fish and wildlife and their habitat from the construction and operation of oil shale related installation and the accompanying regional urbanization. According to the Council on Environmental Quality, the extent to which other public beneficial uses of these resources would be curtailed should be thoroughly investigated. Fish and wildlife and their habitat also have considerable economic value as recreation and aesthetic resources. The irretrievable commitment of these resources should be discussed in terms of economic justification in the final environmental statement.

Mitigating Measures. The Draft states that "Protection of existing water resources will require a much better understanding of their occurrence before mitigating actions can be instituted. Evaluation of data collected prior to mining and monitoring of the resources after mining has begun will be necessary to assure that proper actions are taken and that they are successful". Measures are then listed that "will lead to a better evaluation of water resources, will document causes and effects, and will enable corrective action to be taken that will mitigate the impact on water resources". We suggest that data from the following measures from that list be utilized in drafting the final environmental statement:

- "1. Collection of field data needed to construct and calibrate detailed mathematical models of ground water movement at each mining site;
- "2. Description of the quality of ground water and its relationship to permeability distribution, including water head and quality distribution under development and operating conditions, and their (probable) changes with time;

U. S. Department of Interior  
November 6, 1972  
Page 4

"3. Monitoring of head and quality distribution in aquifers before operations on the lease.

"4. Determination of the quality of water that can be used for various processes and design plant system for best use.

"5. Determination of the quality of effluent from various parts of the plant and the design for use, disposal, or treatment of the waters prior to operations.

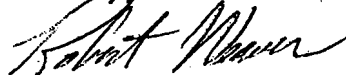
"15. Drilling, testing, and evaluating of possible subsurface sites for waste injection.

"16. Development of a water plan to consider regional, municipal and industrial water supply and waste disposal."

In summary, we hope that the final environmental statement will provide answers to the following questions:

1. How much water will be needed for each use including the oil shale operations, revegetation and municipal needs?
2. Where will the water for each of these needs come from?
3. What will be the total environmental effects of supplying the water for the prototype program and the ultimate potential oil shale development.
4. To what extent will fisheries be damaged by dewatering of streams, decreased water quality and increased pressure from usage?
5. Is the irretrievable commitment of fish, wildlife, their habitat and water resources justifiable in terms of economic benefits?
6. What guarantees are there that environmental damages would be minimized?

Sincerely,



Robert M. Weaver, Executive Director  
Colorado Council of Trout Unlimited

RMW:ps

Enc.



TROUT UNLIMITED COMMENTS ON THE DRAFT ENVIRONMENTAL STATEMENT  
FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

I'm Bob Weaver representing the Colorado Council of Trout Unlimited. We have 12 Chapters with over 800 members in Colorado.

Trout Unlimited has not taken a position either for or against future oil shale development in Colorado. T. U. is mostly concerned with problems associated with supplying water for oil shale, population growth and irrigation for revegetation. We believe that fisheries will be damaged more than the draft environmental statement indicates, especially if the water is supplied by high country water development projects like the Yellow Jacket Project, West Divide, Rio Blanco and Sweetbriar.

The Bureau of Reclamation's Yellow Jacket Project is really an old fashioned backwards method of supplying water for the Piceance Basin. High country dams and miles of canals like Yellow Jacket would seriously damage the entire watershed and wildlife habitat which is why the Colorado Wildlife Commissioners passed a resolution opposing Yellow Jacket and similar projects on the White River drainage above Meeker. We suggest that alternatives for providing water be more thoroughly investigated, like taking water out of the streams farther down. For example, take the water out of the White River below Meeker instead of building Yellow Jacket, or by drilling deep water wells. This may cost more money, but that is the cost of protecting the environment.

Furthermore, we question the legal authority of the Bureau of Reclamation to build projects like Yellow Jacket which are primarily for industrial purposes. The Bureau is charged with building projects which are primarily for irrigation.

If the needs for oil shale are justified and national interest dictates oil shale development, Trout Unlimited asks that it be done in such a way as to minimize watershed damage. We will need more than ever, good land use and water use planning and safeguards to prevent major environmental damage.

We hope the final environmental statement will provide answers to these questions.

1. How much water will be needed for each use, including the oil shale needs, the municipal needs and the revegetation needs.
2. Where will the water for each of these needs come from? High or low in the watershed, surface or ground water?
3. What will be the total environmental effects of supplying this water?

LETTER NO. 48

The White House  
Washington

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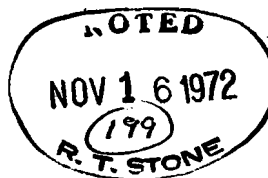
8 PMS PRESIDENT NIXON

9  
10 WHITEHOUSE DC

11 REQUEST YOU REQUIRE INTERIOR RECONSIDER OIL-SHALE ENVIROMENTAL IMPACT  
12  
13 USE OF WATER KILLING OFF WILDLIFE

14 LILLIAN PENGRY CHAIRMAN CONSERVATION LEGISLATION COMMITTEE

15 TUCSON AUDOBON SOCIETY  
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**eco-center**

environmental communications office

UMC 183-C UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

303-443-0349



OFFICE OF

OCT 24 1972 (41)

HEARINGS &amp; APPEALS

James M. Day  
 Director of Office of Hearings and appeals  
 Dept. of Interior  
 4015 Wilson Blvd.  
 Arlington Va. 22203

Dear Sirs:

The environmental impact of Oil Shale Project has not been studied thoroughly.

- 1) Dams and powerplants will be constructed on the White River, Colorado River, and others to supply power and water for the project. It is estimated that every reservoir in the country will be filled with sediments within 200 years.
- 2) Water returned to the Colorado will increase its salinity and seriously doubt whether the companies can economically purify it.
- 3) The problems of population growth have not been seriously considered.
- 4) Tailings from the operations, will completely fill several canyons 800 to 1000 feet in depth.
- 5) The gov't will lease the land for 50¢ an acre while private land in the same area sells for \$2000-\$5000/acre.

Above everything else a coalition of the bureaucrats and the oil industry is attempting to slip by the public, with inadequate publicity and a twenty-day hearing notice, potentially the largest mining operation in the country.

For these reasons and many more we condemn this action of leasing Federal lands to the oil shale industry.

Jeffrey Poland  
 C.U. Wilderness Group President

JP:rjp  
 CC

P.S. Include this in the hearing record.

COMMENTS ON THE  
DEPARTMENT OF THE INTERIOR DRAFT ENVIRONMENTAL  
STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

Glen D. Weaver  
Department of Geography  
University of Wisconsin-Milwaukee

October 19, 1972

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### A. Introduction

On September 7, 1972, the Department of the Interior released a three-volume draft environmental statement for the prototype oil shale leasing program (U.S. Dept. Interior, 1972). The proposed action involves the leasing of up to six tracts of land, two each in Colorado, Utah, and Wyoming, with competitive sales scheduled to begin in January 1973. Each tract comprises approximately 5,120 acres, and could support a plant capacity of at least 50,000 barrels of shale oil per day.

The announced goal of the program is to "provide a new source of energy for the Nation by stimulating the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area" (v. III, p. I-3). Success of the program could lead to the development of an industry capacity of 1 million barrels per day by 1985.

Comments in this review are directed to volumes I and III of the draft statement, which assess the potential environmental impacts of development and the proposed management safeguards. Assessments given in the two volumes are

found to be deficient in these critical areas:

- 1) revegetation of spent shale dumps;
- 2) restoration of wildlife habitat;
- 3) leaching of spent shale dumps;
- 4) erosion of spent shale dumps;
- 5) disposal of saline mine drainage;
- 6) depletion of groundwater and surface water supplies;
- 7) salinity detriments to the Lower Colorado River Basin;
- 8) dust emissions and air pollution meteorology;
- 9) environmental hazards of in-situ processing; and
- 10) economic viability of proposed environmental protection measures.

#### B. Revegetation of Spent Shale Dumps

The processed shale output from a minimum sized commercial plant will cover 28 to 75 acres per year, assuming use of 30 gallons per ton feed and an average disposal height of 250 feet (v. I, table III-3). Development by a mature industry would necessarily cover many thousands of acres with solid wastes.

Problems attendant to revegetation of the shale dumps have not been adequately defined by the Task Force (v. I, p. I-44--I-52), especially those related to the long-term viability of the plant cover which may be established.

Specifically:

- 1) Spent shale as it comes from the retort is highly

saline and highly alkaline, and generally requires leaching by fresh water before good plant growth can be obtained (Schmehl and McCaslin, 1972). Since the natural trend of soil genesis in arid regions is toward increasing salinity and alkalinity (Buol, 1965), will the treatment to reduce excess salts and sodium be permanently effective, or will the soil chemistry revert to an unfavorable status over time after irrigation is discontinued?

2) As parent material, retorted shale would appear ideally suited to the development of sterile solonetz or solonchak soils. Compaction of subsurface layers, which is necessary to minimize leaching of mineral salts from the dump, could expedite the salinization process by restricting downward percolation of water through the root zone. Although soil aeration could be improved by ditching or by installing tile drains, this would require periodic maintenance to be effective over the long run.

3) The black color of unburned residues may cause lethal temperatures for germinating seeds (Schmehl and McCaslin, 1972; Ward and others, 1971, p. 65). Exposure of the residue to direct sunlight by grass fires, erosion, or other disturbances could therefore necessitate a complete and costly revegetation effort.

4) Combustion of the carbon-rich unburned residues may occur if the material is dumped at elevated temperatures



(Nevens and Rohrman, 1966, p. 70). Could the residue also be ignited if exposed to grass fires or camp fires?

5) Accelerated erosion of the dump surfaces would expose untreated residue that is highly saline, highly alkaline, and low in available nitrogen and phosphorus. Natural revegetation of such parent material would take a long time, and would probably yield a very sparse cover.

6) Schmehl and McCaslin (1972, p. 8) have shown that the pH of shale ash is two to three units higher than that of unburned shale, and is so high that little if any plant growth can be expected without treatment to reduce alkalinity. Experiments by the U.S. Bureau of Mines (Spencer and Linville, 1972, p. 79) confirm the difficulty of revegetating shale ash. Exposure of untreated shale ash by erosion would obviously leave a sterile surface incapable of supporting useful plant life.

7) The Task Force claims that recovery of nahcolite and dawsonite from the saline facies would yield a finely-divided waste that is not otherwise materially different from spent shale (v. I, p. I-32). Is this really true? The retorted shale must be roasted to remove the organic carbon residue, thereby producing shale ash; and the dawsonite, in the form of sodium aluminate, will be extracted by an alkaline solution. The pH of the final waste material would seemingly be highly toxic to plant growth.

8) The Task Force mentions that "native soils" would probably have to be placed on the dump surfaces to protect against leaching, as snowfall eliminates compaction in the upper 2 feet of the residue (v. I, p. I-43--I-44). However, the Task Force gives little attention to topsoiling in its discussion of revegetation strategies (v. I, p. I-44--I-52); emphasis is given instead to direct reseeding of the processed shale. Placement of a thick topsoil layer on the waste dumps would reduce, but not eliminate, the potential problems described above.

#### C. Restoration of Wildlife Habitat

This is one of the most important and challenging goals of land reclamation; yet the Task Force passes over the subject by simply acknowledging that "it may be difficult and time-consuming" (v. I, p. I-52).

How difficult and how time-consuming? According to Glover (1971, p. 2), replacement vegetation on disturbed sites is rarely as productive or as suitable as the endemic food and cover plants. White (1970, p. 6) claims that it would take a minimum of 15 years from planting date for shrubs and trees to reach a height capable of supplying wildlife food and cover. Woody shrubs and herbaceous plants are particularly important in the diet of mule deer, which is the leading big game species in the region. The mature pinyon-juniper woodlands, which provide necessary

shelter from weather, hunters, and predators, require a successional period of perhaps 50 to several hundred years (Schiager and others, 1971, p. 74-75).

All six of the proposed lease tracts provide habitat for big game animals, and the two Colorado tracts provide critical wintering grounds for the migrating White River mule deer herd. Colorado tract C-a also lies athwart the migration route for deer summering in the Cathedral Bluffs area to the west, and is bordered on the north and southeast by special habitat areas managed by the State Division of Game, Fish and Parks. The Task Force acknowledges that development of the Colorado tracts would dry up some springs, with a corresponding disruption of the associated plant-animal complex (v. III, p. IV-37, IV-40).

What is the rationale for allowing prototype development in key wildlife areas when the Task Force professes virtually complete ignorance of the prospects for successful restoration of disturbed sites? Selection of the two Colorado lease tracts is certainly not consistent with the program goal of minimizing adverse environmental impacts.

#### D. Leaching of Spent Shale Dumps

##### 1. Surface Leaching

On page III-43 of Volume I, the Task Force explains that "natural cementation takes place over a relatively

short period of time if the spent shale has been moistened and compacted, tending to minimize surface leaching...." This statement is exactly opposite to the experimental results obtained by Ward and others (1971, p. 58), which show that maximum concentrations of mineral salts will be found in the surface runoff when compaction is greatest. Compaction increases the water pollution potential because it increases the capillary action which brings moisture to the surface. On reaching the surface, the moisture evaporates leaving behind a salt deposit that readily dissolves during the next runoff event.

## 2. Subsurface Leaching

On page III-43 of Volume I, the Task Force claims that "mineral leaching by water percolating through the waste piles would not be anticipated to be a significant problem, since moistened and compacted, retorted shale has exhibited low permeability to water in experimental tests."

This broad generalization may be criticized on several grounds, as follows:

- 1) The experimental tests cited by the Task Force (see pages I-42 and I-43 of Volume I) were performed on TOSCO residue, which is known to have an initial permeability at least 10 times lower than the permeability of residues from the Bureau of Mines retort (Ward and others, 1971, table 5). It is also difficult to believe that the Union Oil residue,

which comes out of the retort as a fused clinker, could be compacted into an impermeable mass (see photograph in Ward and others, 1971, fig. 3).

2) The Task Force acknowledges that no tests have been conducted on large volumes of spent shale, such as would be deposited during routine operations (v. I, p. III-43--III-44).

3) Direct vegetative planting of the residues would necessarily leave several feet of uncompacted material that would be subject to leaching by interflow. Ward and others (1971, p. 1) have also shown that snow eliminates the compaction in at least the top 2 feet of the residue.

4) The Task Force acknowledges that flooding of back-filled underground mines might cause leaching of the spent shale, but adds that "mineral concentrations decrease rapidly with continued percolation" (v. I, p. III-43). The Task Force neglects to mention that the estimated equilibrium value of leachate from the TOSCO residue is 1,012 mg/l (Ward and others, 1971, table 8), or about twice the recommended upper limit for public drinking water.

5) Spent shale emplaced in canyon sites or open pit mines excavated below the water table would be exposed to leaching by circulating groundwaters. No assessment is made of this hazard.

### 3. Absence of Permanent Safeguards

The Task Force does not present any plans for covering the dump sites with an impermeable liner to insure against leaching by subsurface waters, nor does it give any plans for permanently impounding the contaminated runoff from dump surfaces.

Failure to control surface runoff would contribute to sediment pollution, as described in the next section.

#### E. Erosion of Spent Shale Dumps

##### 1. Erosion Potential

No explicit standards have been set for retaining the residues in place by revegetation or other land treatment measures, and the Task Force gives no plans for permanently impounding runoff after the sites are abandoned (see v. I, p. III-23; v. III, p. III-14--III-17).

The Task Force acknowledges only that natural erosion of dumps would occur with time (v. I, p. III-44). The rate of erosion could be extraordinarily high, as explained below:

1) Erosion rates tend to reach a maximum under the kind of sparse vegetative cover and semiarid climate that prevails over much of the oil-shale region (Langbein and Schumm, 1958; Schumm and Hadley, 1961).

2) Compaction of the residues would be relatively ineffective in retarding erosion because snowfall eliminates

the compaction in the top foot or so of the piles (Ward and others, 1971, p. 1). Reseeded residues would also be uncompacted in the upper few feet.

3) Experimental tests show that TOSCO residue erodes even on a very flat slope (Ward and others, 1971, p. 61-65). Sediment yields of 10 simulated storm events on a 0.75 percent slope ranged upward to 0.083 pound per square foot per hour, or an equivalent of 1.36 tons per acre per hour. Approximately 50 weight-percent of the residue appears to be subject to erosion by rainfall under the conditions simulated.

4) Dump surfaces in canyon sites would collect runoff from the bordering ridges and tributary valleys (e.g., see v. III, figs. III-17 and III-18). This runoff, plus runoff originating from the dump itself, would necessarily erode new drainage channels in the spent shale material.

5) Deep gullies would likely be cut in the nose of the dumps at the open end of the canyons. The nose would be designed at a slope of  $18^{\circ}$  (v. I, p. III-23), which is far above the maximum permissible slope defined by Ward and others (1971, p. 27) for preventing excessive erosion of the TOSCO residue.

6) The open ends of the canyon disposal sites proposed for lease tracts C-a (Cathedral Bluffs option, v. III, fig. III-12) and C-b (v. III, fig. III-16) are located

less than 1 mile from perennial streams. Although ephemeral runoff events might initially deposit much of the sediment near the dump sites, the sediment could be easily picked up by subsequent flood flows and carried into the perennial streams.

## 2. Environmental Hazards

Erosion of the waste dumps would be highly undesirable for the following reasons:

1) The untreated residues exposed by accelerated erosion would be sterile parent material for soil development and plant growth (see also, section B).

2) Accelerated erosion of the dark-colored unburned residues may cause the receiving stream to run black. This is especially true of the TOSCO or other fine-grained residue, since much of it would be carried in colloidal suspension.

3) The Task Force explains that active dumps will function as depositories for various waste effluents, including partially treated retort water and refinery sour condensate, and untreated boiler-water blowdown, cooling-water blowdown, saline mine drainage, and chemicals used in upgrading operations (v. I, p. I-60, I-63, III-25). The rationale given for such disposal is that the wastes would be trapped in the shale matrix and not leached from the dump. However, erosion could move the wastes into stream



systems where they would be dissolved.

4) The spent shale itself is highly saline and highly alkaline. Solution of the eroded sediments would contribute to salinity pollution of the receiving stream, system.

#### F. Disposal of Excess Saline Mine Drainage

Table III-6 of Volume I presents a trial water balance for two hypothetical mine developments in Colorado's Piceance Creek Basin. Half of the mine water is assumed to be high quality (low salinity) water and the other half is assumed to be poor quality (high salinity).

What is the numerical distinction, in mg/l, between low salinity and high salinity water? Is the assumption of 50 percent low salinity mine drainage justified on the basis of available hydrologic data?

Three disposal methods are listed for the excess saline drainage which may be encountered by the mine developments: (1) desalination, (2) pond evaporation, and (3) subsurface injection into aquifers. Analysis is needed of the economic viability and environmental hazards of the alternative disposal systems, as noted below:

##### 1. Desalination

The cost of desalting high salinity water using available technology would be on the order of \$1 per thousand gallons, or \$326 per acre-foot (Clawson and others, 1969).

Applying this cost estimate to the maximum volume of excess drainage anticipated for the Colorado sites yields an equivalent of:

$$\frac{(\$326 \text{ af}) (1,660 \text{ afy})}{(50,000 \text{ bbl/day}) (365 \text{ days})}$$

= nearly 3¢ per barrel of semirefined oil for a plant capacity of 50,000 barrels per day. The desalting operation would also create a substantial brine disposal problem. Is desalination a feasible alternative?

## 2. Pond Evaporation

Pond evaporation requires an impervious closed basin and a high rate of natural evaporation. Disposal of the maximum volume of excess drainage anticipated for the Colorado sites would require an evaporative surface of more than 640 acres ( $>1 \text{ mi}^2$ ) for each lease tract, assuming gross annual evaporation is about 40 inches and annual rainfall is 10 inches. The pond sites should be lined with impermeable materials to prevent seepage into underlying groundwater aquifers, and abandonment of the ponds would leave large salt flats in need of reclamation.

## 3. Subsurface Injection

Chapter IV of Volume III states that injection into the lower part of the leached zone aquifer is a possible means of disposal, although the injection would probably displace saline groundwater into the upper part of the

leached zone causing it to become more salty, or might increase the rate of movement of saline water towards the mine.

The groundwater flow pattern described by Coffin and others (1971) suggests that injection into the leached zone would also displace saline groundwaters into the Evacuation Creek Member and thence into surface streams.

Experience in other areas has shown that injected wastes, or saline waters displaced by the injection, often migrate into freshwater aquifers or leak to the surface (Evans, 1968; Nace, 1972; Piper, 1969).

#### G. Depletion of Water Yield

The already low volume of water yield in the oil-shale region would be seriously depleted by development activities of a mature industry.

Groundwater systems would be especially sensitive to overdraft of aquifers or disruption of intake areas because of the low rates and limited areal extent of replenishment. Coffin and others (1971) warn that intensive well pumpage in the Piceance Creek Basin would cause water levels to decline several hundred feet in less than 1 year. Continuous pumpage for a number of years could dry up springs over a large part of the basin and stop much of the seepage to creeks. Large overdrafts in the leached zone might

cause aquifer compaction, with permanent loss of storage capacity, subsidence and rupture of the land surface, and derangement of the surface drainage net. Declining water levels would be accompanied by an increase in salinity of the remaining groundwaters.

The Task Force admits that mine dewatering of tract C-a would dry up two known springs (v. III, p. IV-37); while dewatering of tract C-b would reduce the artesian pressure sufficiently to deplete streamflow in Piceance Creek (v. III, p. IV-22). The hazards of aquifer compaction and declining water quality are also acknowledged (v. III, p. VII-5--VII-6).

More information is needed on the expected magnitude and importance of the water depletions. What is the present yield of the two springs that would be desiccated on tract C-a? Yellow Creek, which receives drainage from the tract, has a mean annual discharge of only 1.37 cfs at the gaging station near White River (Coffin and others, 1971, sheet 2). Hence a small reduction in base flow would be crucial to the sustained fair-weather flow of the stream. The same is true of Piceance Creek, which has a mean discharge below Ryan Gulch of only 12.5 cfs (Coffin and others, 1971, sheet 2).

The available information suggests that additional mine developments in the White River drainage of Piceance

Creek Basin could result in virtually complete desiccation of surface water supplies. Well pumpage to prevent flooding of the mines would drop the water table and piezometric head, thus drying up springs, flowing wells, and seepage to live water courses. Extraction of the oil shale from beneath thousands of acres would create a labyrinth of new underground voids that would change existing hydraulic gradients and patterns of groundwater flow. Evaporative losses from flood-control impoundments would dissipate much of the direct runoff yield.

The Piceance Creek Basin contains the richest sequence of oil-shale deposits. Before any commitments are made to mineral leasing, however, the Task Force should present a detailed scenario of the hydrologic response to large-scale mineral development. The scenario may well show that mineral development would create an artificial desert incapable of supporting the large mule deer population for which the basin is now famous.

#### H. Salinity Detriments to the Lower Colorado River Basin

Salinity pollution is currently the most serious water quality problem in the Colorado River Basin, and is expected to worsen steadily in the future unless appropriate control measures are taken.

A recent study by the U.S. Environmental Protection Agency (1971) shows that high salinity levels adversely af-

fect the water supply for over 10 million people and for 800,000 irrigated acres located along the lower main stem and in the southern California water service area. Negative impacts are also felt in Mexico and in limited areas of the Upper Basin.

Salinity detriments to the regional economy below Hoover Dam, excluding Mexico, are estimated to total \$16 million annually under present conditions. If water developments proceed as proposed and no salinity control measures are implemented, total annual detriments in 1970 dollars will increase to nearly \$28 million in 1980 and about \$51 million in 2010. Salinity increases above those anticipated for 1980 would produce incremental penalty costs of \$80,000 for each unit rise in salinity concentration at Hoover Dam above the projected level of 876 mg/l.

Oil-shale development would unavoidably exacerbate the salinity problem by depleting the volume of dilution flows in the Colorado main stem. The Task Force estimates that maximum consumptive use by a mature industry would increase the projected salinity concentration at Hoover Dam by 6 to 10 mg/l (v. I, p. III-39). At \$80,000 per unit of salinity increase, the associated penalty costs would be \$480,000 to \$800,000 annually, or as much as 2.2¢ per barrel of shale oil capacity.

Additional penalty costs would accrue from any net

salt loading caused by improper disposal of saline mine drainage, industrial and municipal return flows, or leaching and erosion of spent shale dumps (see earlier discussions in sections D-F). The Task Force should give order of magnitude estimates of the potential salinity detriments associated with these sources.

#### I. Dust Emissions and Air Pollution Meteorology

The Task Force estimates that a minimum sized commercial operation could release up to 40 tons per day of fugitive dust from mining, crushing, and conveying the raw and spent shale, assuming 98 percent primary dust capture efficiency (v. I, p. III-50). The potential emission is described as a "manageable" quantity, since much of it would "probably" be controlled by water hosing, water sprays, etc.; and, unlike particulates in powerplant stack gases, which are emitted up to several hundred feet in the atmosphere, the fugitive dust would tend to settle out in the vicinity of the plant itself. Residual dust losses after primary capture from enclosed crushing and screening operations are estimated at about 35 pounds per hour in 400,000 cubic feet per minute of air (v. I, p. III-47). This is said to be below the EPA emission standard for incinerators.

These qualifications need further explanation. Katell and Wellman (1971, p. 4) mention that uncontrolled dust

losses from the Bureau of Mines crushing and screening plant would equal 1.32 percent of the raw shale handled. Assuming 75,000 tons per day throughput and 98 percent overall dust capture, this translates to a controlled emission rate of 19.8 tons per day. Dust losses from the TOSCO crushing and retorting plant may range upward to 2 percent of the raw shale handled (Whitcombe, personal commun., 1970), or 30 tons per day if controlled at the 98 percent level. Even at 99 percent control the emissions would still be 9.9 to 15 tons per day. Most of the particles would be in the smaller aerosol size range, as the larger ones would have been controlled by wet scrubbers, water hosing, or other means.

By comparison, particulate emissions from all inventoried man-made sources in Uintah County, Utah, totalled a mere 2 tons per day in 1968 (Utah Dept. Social Services, 1970, table XV). A similar inventory of the 16 counties in northwestern Colorado (Grand Mesa and Yampa Air Pollution Control Regions) showed a total particulate emission of only 14.5 tons per day (Colo. Air Pollution Control Comm., 1971). Two oil-shale plants each emitting 30 tons per day would exceed the total particulate mass emitted by all inventoried sources in Metropolitan Denver.

The Task Force also claims that cementation reactions at the surface of spent shale dumps could be expected to



virtually eliminate fugitive dust releases from the dumps. (v. I, p. III-50--III-51). Has this been demonstrated in laboratory or field experiments? Ward and others (1971, p. 10), who have studied the hydrologic properties of spent shale, mention that dust from the dried out residues could contribute to air pollution. The finely-divided TOSCO residue (or the residue left after sodium mineral processing) would seem to be especially vulnerable to wind deflation.

On page III-53 of Volume I, the Task Force comments that source emissions must be so controlled that pollutants would not accumulate under inversion conditions. Is it possible to control dust emissions to a level that would not violate ambient standards under the persistent nocturnal inversions that characterize the region? For example, use of the atmospheric dispersion estimates given in Schiager and others (1971, table 32) shows that a ground-level emission of only 1 ton per day would produce an ambient concentration of approximately  $2,800 \text{ ug/m}^3$  at 1 kilometer downwind. Weaver (1972, table 6) has shown that an emission strength of 15 tons per day could produce an ambient concentration of nearly  $1,300 \text{ ug/m}^3$  at 20 kilometers downwind.

#### J. Hazards of In-Situ Processing

On page IV-21 of Volume III, the Task Force has this to say: "In situ development potentially could cause problems of groundwater contamination from the retorting process

and from shale left in place. It is difficult to judge either the type or severity of these problems until an in-situ process is perfected and a prototype operation is undertaken."

The Task Force is consistently reluctant to provide substantive data on the environmental hazards of in-situ processing. This reluctance is inexcusable for the following reasons:

1) The U.S. Bureau of Mines has conducted two field retorting experiments near Rock Springs, Wyoming, including one that is currently operative. Equity Oil Company has been conducting a retorting experiment in the Piceance Creek Basin since 1964. Shell Oil Company is presently conducting another field experiment in the Piceance Creek Basin. Are we to assume that the Task Force is ignorant of the technological and environmental parameters of these field tests?

2) The technological aspects of in-situ processing are sufficiently well known that substantive conceptualizations can be made regarding potential environmental impacts (Weaver, 1971, 1972).

3) One of the principal functions of the NEPA 102 statements is to assess the environmental hazards of new technology before it is perfected and put to use. The Task Force consistently implies that few judgments can be

made until the in-situ process has been demonstrated on a commercial scale.

#### K. Economic Feasibility of Environmental Controls

The total cost of producing shale oil may be resolved into three components: (1) process costs, (2) environmental protection costs, and (3) social costs of environmental degradation. Although the three components are not completely separable, it would be possible in many cases to quantify the marginal costs of alternative protection measures, and to identify in monetary or physical units the residual social costs, if any, that cannot be avoided.

The proposed leasing of six tracts of 5,120 acres each represents a substantial investment of public land resources to stimulate development of commercial oil-shale technology. Implementation of the program would also involve investing substantial amounts of public monies for environmental planning, program evaluation, and related research activities.

An economic benefit-cost analysis of shale-oil production may well demonstrate that the proposed prototype program is a submarginal endeavor.

## L. Conclusions and Recommendations

1) The Task Force analysis of problems attendant to revegetation of shale dumps is amateurish and superficial. Recognition must be given to possible changes in the edaphic properties of the spent shale medium, and to the homeostasis of the plant cover which may be artificially established on the dumps. Assessments must be made of the possibility that fluvial erosion or other dynamic processes may expose untreated residues and thereby create a sterile land surface incapable of supporting useful plant life.

2) Mineral development should not be allowed in key wildlife habitats such as the Piceance Creek Basin mule deer winter range until explicit performance standards and time schedules have been set for reseeding wildlife food and cover plants, and until it has been reasonably demonstrated that the lease stipulations can be met.

3) Lease stipulation 11 (L) permits the Leasee to choose among three revegetation programs (see v. III, p. V-70). The choice of revegetation program should be at the discretion of the Mining Supervisor, after proper consultation with the Bureau of Land Management.

4) The leaching potential of spent shale dumps has not been adequately assessed by the Task Force. Indeed, portions of the analysis are inexcusably misleading. All dump sites should be lined with an impermeable barrier to

insure against subsurface leaching, and contaminated runoff from the dump surfaces should be impounded. Backfilling of underground mines should not be allowed if the mine voids are accessible to appreciable quantities of circulating groundwaters.

5) Fluvial erosion of shale dumps would contribute to sediment and salinity pollution, and may expose untreated spent shale that is toxic to plant growth. Accelerated erosion of the fine-grained unburned residues would cause the receiving stream to run black. Because of the high erosion potential, explicit standards should be set for the effectiveness of land treatment measures in retaining the surface material in place, and permanent retention dams should be built downstream to impound contaminated runoff waters. Payment should be required from the Leasee to cover the long-term expense of maintaining the flood-control structures.

6) The proposals for disposing of excess saline mine drainage need further study. Injection into the leached zone aquifer would seem to invite both groundwater and surface water pollution. Desalination is not likely to be economically feasible, and pond evaporation would require large acreages if large volumes of mine drainage are encountered.

7) The Piceance Creek Basin appears to be especially

vulnerable to overdraft of groundwater aquifers and desiccation of surface water supplies. The Task Force should provide numerical data on the probable magnitude of water depletions caused by the two proposed lease developments or other lease developments which may be considered in the future.

8) Factors which may contribute to salinity pollution of the Colorado main stem should be more thoroughly evaluated, and potential detriments to the service area below Hoover Dam should be assessed in economic terms. The Task Force apparently has not acquainted itself with the comprehensive EPA study of the mineral quality problem in the Colorado River Basin.

9) Numerical estimates can and should be made of atmospheric dispersion rates and ambient concentrations of air pollutants. Such estimates would show that, under inversion conditions, it will be extraordinarily difficult if not impossible to control dust emissions to a level that will not violate state ambient air quality standards.

10) New in-situ experiments should not be considered until the environmental hazards of ongoing field tests have been thoroughly evaluated and made known to the public. A National Environmental Policy Act 102 statement should be required for the Bureau of Mines experiment near Rock Springs, Wyoming, and cooperative assessments should be

made of the Equity Oil and Shell Oil Company experiments in Colorado.

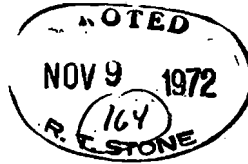
11) Any final decision on the prototype program should be conditional on an economic analysis of the total anticipated costs and benefits of shale-oil production. The analysis should consider the marginal costs of alternative environmental protection measures and the residual environmental degradation costs which cannot be avoided. Until this is done, the public is being asked to invest resources in a blind venture.

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611 South 1st East  
Brigham City, Utah 84302  
November 3, 1972

STATEMENT ON THE PROPOSED OIL SHALE LEASING PROGRAM ON PUBLIC LANDS - To be added to the statements made at the hearing held in Salt Lake City, Utah on October 13, 1972

From: ARABELLE MCDONALD of the Utah Audubon Society

I was unable to attend the above hearing due to circumstances beyond my control which occurred too late for me to be there.

However I do wish to have the following included:

I feel that there is a real crisis on our hands in regard to the proposed leasing program because programs should not be started on public lands until the entire process is very carefully researched and planned. Environmental impact statements should be completed and reviewed before Special Use or Exploration Leases are let on public lands. Present results of studies have been deemed inadequate.

Oil companies have special holdings where experimental use of the oil shale may be done instead of using public lands for this purpose. Results of the experimentation should indicate whether adequate provision can be made to prevent deleterious effects. Any mistakes made while development is going on, if these studies have not been made would be irreversible.

The residue from oil shale use for oil takes up more space after it has been processed. If adequate planning is not done before development, the residue can easily pollute the atmosphere by being easily blown about and/or be washed into streams during precipitation. Other serious problems would be the production of saline water from dewatering of open pit or room-and-pillar mines and leaching of salts from overburden and/or spent shale. These could easily result in additional amounts of dissolved salts being placed into the Colorado River Basin. At the present time other causes have resulted in water too saline to be used for irrigation and other purposes down river. Natural springs in the original area could also be contaminated with salts. Water is scarce and guarded in the shale area at present. Water from the River would need to be used for the processing.

Development without proven adequate planning to avoid these results may result in oil shale development being one of the most damaging industries to the environment.

*Arabelle McDonald*

OFFICE OF

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HEARINGS & APPEALS

*The Wilderness Society* + ———4260 E. Evans Avenue, Denver, Colorado 80222  
Western Regional Office Phone (303) 758-2266

November 17, 1972

Mr. James M. Day  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

Please make these comments a part of the hearing record on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program. We had requested permission to testify at the October 10, 1972, hearing in Denver, Colorado, but were unable to have a representative present on that occasion.

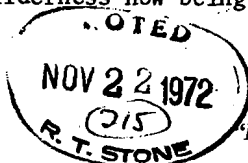
The Wilderness Society is a national, non-profit, private conservation organization of approximately 80,000 members who are primarily involved in educational programs to assure the preservation of wilderness on our publicly owned lands for the use and enjoyment of present and future generations. About 2,000 of these members reside in Colorado, Utah, and Wyoming -- the states directly involved in the oil shale development program.

We appreciate the considerable amount of investigation, study, and effort that officials in the Department of the Interior have put into the preparations of an environmental impact analysis of the proposed prototype oil shale project. Certainly, without the benefit of much information contained in the Environmental Statement there would be little recognition by the federal government and the public of the full on-site and off-site impacts of such a program.

Nevertheless, we feel that inadequate consideration has been given in the Environmental Statement to the adverse effects such a program and its anticipated expansion would have upon the:

1. free-flowing South Fork of White River.
2. cutthroat trout and whitefish fisheries of the South Fork of White River and tributaries which provide natural recruitment of these rare and endangered species in the Flat Tops Primitive Area and adjoining areas.
3. major elk and deer herds which winter in the project area but summer in the high country of the Flat Tops Primitive Area and adjacent wild lands.
4. potential Wilderness of the Flat Tops Primitive Area and adjacent wild lands.

It should be noted that the wild South Fork of White River has been recommended for inclusion in the National Wild and Scenic Rivers System. It is one of the extremely few reaches of river in Colorado which still qualify for a "wild" designation. The wild segment of the river and contiguous undeveloped lands have been proposed by local, state and national conservation organizations, as well as by the Colorado Division of Wildlife, for inclusion in the Flat Tops Wilderness now being considered by Congress. Water development, dams,



"In Wilderness is the Preservation of the World." -- Thoreau

impoundments, and diversion of the South Fork of White River and adjoining area would have major adverse effects on cutthroat trout and whitefish populations, elk and deer herds, in addition to other wildlife, as well as eliminate the South Fork of White River from further consideration as a National Wild and Scenic River. Over 20,000 acres and seventeen miles of highly scenic natural river and adjacent wild lands which qualify for classification as a part of the proposed Flat Tops Wilderness would be lost by the planned development and diversions of the South Fork for oil shale programs.

These undeveloped national forest lands serve as high quality calving and fawning areas and wintering grounds for elk and deer. They are also used for quality wilderness hunting and fishing. Loss of areas important to natural reproduction for these species of fish and wildlife would have a decimating effect on their populations within the proposed Flat Tops Wilderness. The Flat Tops and project area serves as the habitat of two of the largest elk and deer herds in Colorado. The South Fork of White River is probably the only source in this state of the Rocky Mountain Whitefish and one of the principal sources of the indigenous cutthroat trout. These species, along with the magnificent elk, do not prosper without essentially an undisturbed wilderness environment.

Many of our members and cooperators in Colorado and throughout the Nation make substantial use of the greater undeveloped Flat Tops area including the South Fork of White River -- for wilderness recreation, camping, horse-back packtrips, backpacking, sightseeing, fishing, hunting, wildlife research and observation, and photography. The Wilderness Society annually conducts at least two organized wilderness trips into the wild South Fork of White River and the Flat Tops Wilderness beyond. Participants come from all parts of the United States.

The environmental impact of an expanded mature oil shale industry has not been properly considered. To explore the expected impact of a prototype project only, when all plans point in the direction of major expansion by 1985 and beyond, leaves the Environmental Statement incomplete and non-conclusive as to the full, long range effects of the oil shale program upon renewable and non-renewable natural resources in the region, as well as upon the many citizens involved.

The major off-site effects of the oil shale program upon these resources and the citizens involved, including a general land use analysis, have not been adequately dealt with in the Draft Environmental Statement.

Wilderness is a rare and irreplaceable natural resource. Once destroyed, the primeval scene can never be restored. In two-thirds of the states, where most of the 208 million Americans live, little or no wilderness remains. Consequently, areas of wilderness, such as the proposed 235,000-acre Flat Tops area, must serve not only the citizens of Colorado but also the Nation.

In conclusion, the best relatively accessible shales, containing thirty gallons per ton, may amount to only about 80 billion barrels. By the year

two thousand, this might represent a mere five-year supply for the United States. Compared with the loss of irreplaceable wilderness, wild river, and wildlife resources, the benefits from usable oil shale could turn out to be disappointingly small. Thus, the Environmental Statement must adequately analyze the matter of land use for the greater area that would be impacted by an expanded, mature oil shale industry.

We appreciate the opportunity to make these comments.

Sincerely,

A handwritten signature in dark ink, appearing to read "Clifton R. Merritt", is written over a horizontal line. The signature is fluid and cursive.

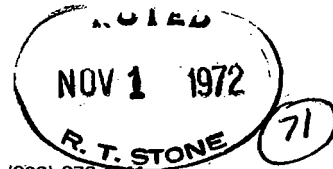
Clifton R. Merritt  
Director of Field Services

cc: Mr. Russell E. Train, Chairman  
Council on Environmental Quality  
722 Jackson Place, N.W.  
Washington, D.C. 20006

Environmental Protection Agency  
Region VIII  
Federal Office Building  
19th and Stout  
Denver, Colorado 80202



LETTER NO. 53



SUITE 800, PLAZA ONE / P. O. BOX 151, AMARILLO, TEXAS 79105 / (806) 376-4841

E. S. Morris, president

October 23, 1972

Action Office *Red Stone Rm. 7000*  
For info only *MR LM*

Rogers C. B. Morton, Secretary  
U. S. Department of the Interior  
Office of the Secretary  
Washington, D. C. 20240

Re: Environmental Statement for the  
Proposed Prototype Oil Shale  
Leasing Program  
September, 1972

Dear Sir:

Our company is an oil and gas company that has aligned itself with other independent companies in a joint venture. The sole and exclusive purpose for the joint venture is to develop the necessary research and technology to prove the feasibility of in situ recovery techniques as applied to oil shale recovery.

Our country is confronted with an acute energy crisis, and it is imperative that government and industry cooperate in solving our nation's problems at the earliest possible time. We are at present importing approximately 25% of our nation's oil requirements, and it is estimated that we will be importing more than 50% of our nation's needs by 1985. The impact of this reliance on imported crudes creates serious problems concerning our national defense and will materially aggravate this nation's balance of payments problems. We have very little time to solve this dilemma; therefore, a concerted effort should be made to develop the needed and varied technology necessary to make the oil shale industry a reality.

We respectfully submit that the Department of Interior's announced intention to award leases on the basis of cash bids will frustrate

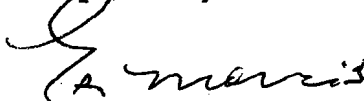
the very purpose of the sale. The proposed offering should not be designed to raise revenues, but rather to develop key technology at the earliest possible date. Funds expended for cash bonuses and rentals will necessarily result in a limitation of funds available for research and development.

It is our judgment that a bidding contest will be dominated by major oil companies which will rely on conventional mining techniques that will not materially contribute to the state of the art. The feasibility of the in situ approach to oil shale recovery can be demonstrated only theoretically; consequently, its application is with considerably more economic risk than other conventionally proven techniques. Cash bids will necessarily be adjusted commensurately with risks and this may ultimately result in the preclusion of valuable and needed technology.

If the in situ approach can be successfully adapted to oil shales, environmental problems attendant to mining techniques can be eliminated and the oil produced at substantial savings. This would open the door to a competitive bidding situation on the other 99+% of the shale oil lands owned by the federal government, result in a tremendous source of future revenues and more rapidly alleviate the nation's insatiable demands for more and more energy.

We are at a loss to understand the logic applied to the apparent order of issue of the proposed leases and would hope the Department of Interior would consider a revision. We would like to suggest that a more appropriate order of issue would be Colorado a and b, Utah a and b, and Wyoming a and b.

Respectfully submitted,



E. S. Morris

LETTER NO. 54

LAW OFFICES  
**MORAN, REIDY & VOORHEES**

818 PATTERSON BUILDING  
DENVER, COLORADO 80202

JOHN R. MORAN  
EUGENE A. REIDY  
JAMES D. VOORHEES  
JOHN R. MORAN, JR.

222-3895

November 7, 1972

The Honorable James M. Day  
Director  
Office of Hearings and Appeals  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

On November 6, 1972 the undersigned, acting for American Petrofina, Incorporated, forwarded to your office a Supplemental Statement regarding the "Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program" to be made part of the record from the October, 1972 hearings. Through inadvertence, the Supplemental Statement was not signed prior to mailing.

Enclosed are an additional two signed copies of the Supplemental Statement which we request be substituted for the two copies previously forwarded to your office.

Yours very truly,

MORAN, REIDY & VOORHEES

By 

JRM, JR:mmm

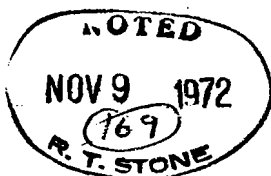
Enclosures

AIR MAIL - SPECIAL  
DELIVERY

OFFICE OF

NOV 8 1972

HEARINGS & APPEALS





BEFORE THE UNITED STATES DEPARTMENT OF THE INTERIOR  
OFFICE OF HEARINGS AND APPEALS

IN THE MATTER OF

DRAFT ENVIRONMENTAL STATEMENT FOR  
THE PROPOSED PROTOTYPE SHALE LEASING  
PROGRAM.

)  
)  
) SUPPLEMENTAL STATEMENT  
)  
)

COMES NOW, AMERICAN PETROFINA, INCORPORATED and pursuant to directions of the Secretary of the Interior permitting the filing of a Supplemental Statement by participants at the October, 1972 hearings regarding the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program (the "Statement") respectfully submits the matters herein set forth.

The energy products division of American Petrofina, Incorporated is operated by American Petrofina Company of Texas, which is responsible for the exploration and production of crude oil and natural gas and for refining and distributing conventional refined products. American Petrofina Company of Texas markets its products principally under the FINA brand.

FINA has joined with certain other oil producing companies in underwriting the costs of the informational core drilling phase of the Oil Shale Leasing Program (the "Program") announced by the Secretary of the Interior on June 29, 1971. In consequence of an evaluation of core drilling information, FINA has participated with others in submitting a nomination for a proposed leasing tract under the Program.

The three volume Statement leaves no doubt that the Program will have an impact on the environment surrounding the six selected lease tracts. However, what must be discerned is that the Statement has as its purpose the assessment of those impacts from both a prototype development phase and a mature industry phase. Claims of or assertions by hearing participants that an oil shale leasing program has no justification or that alternative fuel sources should be pursued to the exclusion of shale oil ignore entirely that the objective of the Statement is the assessment of impacts from an oil shale industry.

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NOV 8 1972

HEARINGS & APPEALS

A most important consideration at this time, and at the inception of the actual commencement of development, is that the initial stages of development involve only a prototype program, or stated in another way, that the initial stage is one to test feasibility of shale oil development. "The stated program goal (is) to stimulate '...the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area.' To achieve these goals (there has been) provided an interlocking set of bonus, royalty, bonding, and performance provisions to be incorporated into the leasing provisions." (Vol.3,I-7).

The mitigating measures which would be taken to assure satisfaction of the environmental concepts presented in the Statement are contained in the proposed lease together with special stipulations supplementing governmental regulations and these "insure that environmental impact caused by the prototype oil shale development on the immediate and adjacent area would be minimized." (Vol.3,V-1).

It must be kept in mind that "the direct energy gain from (the) proposed prototype program would approximate 250,000 barrels per day by 1981. Viewed within the context of increasing energy demand, this will not provide a significant short-term (under 10 years) impact on oil supplies. However, the establishment of a proven technology and support facilities are important to the nation's long-term need for clean energy." (Vol.3, VIII-1). ....The proposed program, if implemented, could be expected to lead the way to long-term productivity and economic benefits throughout the entire oil shale region. Improvements in technology would be expected to result in increasingly effective use of the resource and concurrently would result in a more adequate identification of oil shale environmental problems, and the development of improved methods for their control or mitigation during processing." (Vol.3, VIII-2). (Emphasis supplied).

The development of Federal oil shale lands involves participation by industry and by government toward a common goal and with the maximum as-

urance that the interests of all will be protected. These assurances will come by way of the stipulations referred to above, but it should not be overlooked that a condition to even submitting a bid for lease requires the participants to submit a preliminary plan of development for the prototype and for each subsequent stage of development, as development progresses, and each of these development plans can be scrutinized for mitigating measures to assure satisfaction of environmental concepts.

It will be through the prototype program that information will be gathered and evaluated, thus providing a period of assessing impact. It will be through the prototype program that long-range problems are identified and solutions found. Implicit in the prototype is that if industry cannot or does not act to serve the best interests of all, the presence of the government, from the inception of the Program, assures protection of the public's interest.

FINA, on whose behalf this Supplemental Statement is presented, urges the Department to continue its present perspective looking toward an initial stage prototype program as a learning phase and as a phase during which environmental concepts can be tested and perfected.

Respectfully submitted,

MORAN, REIDY & VOORHEES

By 

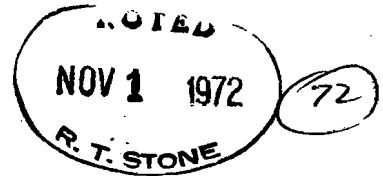
John R. Moran, Jr.  
Attorneys for American Petrofina,  
Incorporated  
818 Patterson Building  
Denver, Colorado 80202  
Phone 222-3895



H. F. BOLES  
Vice President  
Exploration & Minerals  
Department

# APCO OIL CORPORATION

17TH FLOOR HOUSTON NATURAL GAS BUILDING  
HOUSTON, TEXAS 77002  
TELEPHONE 713-224-0610



October 27, 1972

Mr. Rogers C. B. Morton  
Secretary, U. S. Dept. of the Interior  
Interior Building  
Washington, D. C.

Action Office  
For info only

*Reid Stone*  
*Rm 7000*  
*MR*  
*LM*

Dear Mr. Morton:

Apco Oil Corporation is an integrated oil company engaged primarily in production, refining and marketing of petroleum and petroleum products in the Mid-Continent area of the United States.

Apco operates two crude oil refineries located at Cyril, Oklahoma, and Arkansas City, Kansas. During 1971, Apco's refinery thru-put of crude oil averaged 34,000 barrels per day. The company produces approximately 5,000 barrels of oil per day in the United States. Because of our crude oil deficiency, active exploration for new oil and gas reserves is in progress in various parts of the United States. We are also seeking other new sources of energy such as coal, geothermal, etc.

For the foregoing reasons, Apco made the decision several months ago to participate in an oil shale research bidding group. Several medium-sized oil companies such as Apco participate in the group. We hope to be competitive with the major oil companies by contributing technology and development capital in exploitation of shale oil reserves which effort is of such monumental importance to the future of this country. The operator of our group is Geokinetics, Inc., who along with other participants in our group have extensive oil shale expertise including in situ technology.

We wish to comment as follows on the Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program issued by the Department on Interior on September 7, 1972:

The proposed bidding procedure would preclude the participation by the independent oil producer in the new program

Mr. Rogers C. B. Morton  
October 27, 1972  
Page Two

because of financial resources of the major companies. In our opinion, such an offering is not in the public interest because the industry would be placed in the hands of the major oil companies who already control the private oil shale lands. Comparative recognition should be given to the importance of the independent in developing our oil and gas industry through the years. A balanced and expeditious development of oil shale lands would result by affording the independent an opportunity to participate.

The independent companies who do not have oil shale properties should be given priority in bidding to provide adequate crude oil for their future requirements.

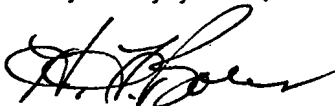
The independent companies can make a significant contribution to development and technology if oil shale properties can be acquired on a reasonable basis. Historically, this has been true in the natural resource extractive industries when proper incentives are present for the smaller operators.

It is also noted that only six leases are being offered, and there is no assurance as to when additional leases may be offered. We would like to suggest that the leases be offered in the following sequence:

Colorado	A
Colorado	B
Utah	A
Utah	B
Wyoming	A
Wyoming	B

Your consideration of our position and requests will be appreciated.

Very truly yours,



H. F. Boles  
Vice President  
Exploration & Minerals

HFBma

# HOLLAND & HART

ATTORNEYS AT LAW

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TELEPHONE 925-3476 AREA CODE 303

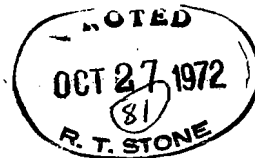
October 23, 1972

ARTHUR C. OAILY  
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JOHN UNDEM CARLSON  
BRUCE W. SATTLER  
RANDY L. PARCEL  
JOSEPH M. DE RAISMES  
GRAHAM M. CLARK, JR.  
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SAMUEL P. GUYTON  
JOHN S. CASTELLANO  
DENNIS M. JACKSON  
ROBERT E. BENSON  
DONALD O. KINONEN  
RICHARD M. KOON  
CHARLES T. BRANOT  
ROBERT T. GONNERY  
HARADON BEATTY



Mr. Reid T. Stone  
Oil Shale Co-ordinator  
U.S. Department of Interior  
Room 7000, Interior Building  
Washington D.C., 20240

Re: September, 1972, Draft  
Environmental Statement  
for the Proposed Proto-  
type Oil Shale Leasing  
Program

Dear Mr. Stone:

Our client, Bell Petroleum Company, is one of the private organizations from which comments have been requested on the captioned Draft Environmental Statement. I would refer you to our previous correspondence concerning the proposed prototype program and Bell's position with regard to the program, to wit:

(1) Letter from the undersigned to you dated February 28, 1972, concerning Nominated Tracts 4, 5, 6, 7, 8, 10, and 17, Bell's mineral interests therein and the interests therein of the Colorado Department of Game, Fish and Parks; and

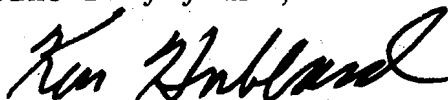
(2) Letter from the undersigned to Regional Solicitor Palmer King (with copy to you) dated April 11, 1972, clarifying Bell's position.

In addition, Bell has recently filed its Petition for Decision and Brief in support thereof with the Director of the Bureau of Land Management concerning the ownership of the minerals in 240 acres of land included within Colorado Tract C-a of said proposed prototype oil shale leasing program. See pages II-1 through II-9 of Vol. III of the captioned Draft Environmental Statement. This is the same 240 acre tract referred to in the above correspondence as a part of Nominated Tracts 4, 5, 7, 8 and 17.

The captioned Draft Environmental Statement also refers to Alternate Colorado Sites C-6 and C-10. See, respectively, page IX-22 through IX-28 of Vol. III of said Draft Environmental Statement and page IX-72 through IX-78 of said Vol. III. Bell also owns mineral interests in certain of the lands included in these sites. Bell's specific mineral interests and the specific lands involved are as set forth in the above-mentioned letter of February 28, 1972 under "Nominated Tract 6" and "Nominated Tract 10", these tracts being the same as Alternate Colorado Sites C-6 and C-10, respectively (except that the NW $\frac{1}{4}$ NE $\frac{1}{4}$  of Sec. 15, T. 1 S., R. 97 W. appears to have been inadvertently omitted from the description of Site C-6 at the top of page IX-23, Vol. III). Concerning these alternate sites, we wish to point out that the mineral title situation is even more complicated than it is for Tract C-a, there being certain lands in these alternate sites wherein the United States reserved no minerals. In the aforementioned Petition, Bell has stated that it might wish to amend or supplement its Petition should it appear that one of these alternate sites might be selected.

Bell wishes to reiterate its statement in my letter to Mr. King of April 11, 1972, that it does not wish in any way to inhibit the prototype leasing program if it can be assured that its mineral interests can be adequately protected in some way. This is the primary reason for the approach taken to date of writing these letters and filing the aforementioned Petition, rather than attempting to obtain an injunction or pursue some other more drastic remedy. Should any of the tracts mentioned in the captioned Draft Environmental Statement ultimately be the subject of leasing activity, it is our feeling that some steps will have to be taken to assure that Bell's interests are so protected. We would welcome the opportunity to discuss any of this in more detail with representatives of the Department at any time.

Sincerely yours,



Kenneth D. Hubbard  
for HOLLAND & HART

KDH/bw

cc: Mr. Palmer King, Regional Solicitor  
Colorado State Director, Bureau of Land Management  
Mr. Harry Woodward  
Gerald W. Wischmeyer, Esq.  
Mr. Ralph Tingle, President, Bell Petroleum Co.

# HOLLAND & HART

ATTORNEYS AT LAW

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October 25, 1972

JOSIAH G. HOLLAND  
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PATRICK H. WESTFELDT  
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JACK L. SMITH  
STEVEN M. HANNON  
JOHN D. COOMBE  
EUGENE F. McGUIRE  
SOLOMON N. BARON

## CERTIFIED MAIL

## RETURN RECEIPT REQUESTED

Honorable Burton W. Silcock, Director  
Bureau of Land Management  
Department of the Interior  
18th and C Streets, NW  
Washington, D. C. 20240

Re: Request for Decision with Respect to  
Mineral Reservations in Patent No. 990142

Dear Mr. Silcock:

Our client, Bell Petroleum Company, owns an interest in the mineral estate in 240 acres of land included within Colorado Tract C-a, which tract is one of the two tracts that have been selected for leasing in Colorado pursuant to the Department of the Interior's Proposed Prototype Oil Shale Leasing Program. Bell also owns mineral interests in certain of the lands included within Alternate Colorado Sites C-6 and C-10.

Bell believes that it is important that a prompt determination be made of what specific minerals are owned by the United States within said Colorado Tract C-a. Accordingly, we submit herewith on behalf of Bell an original and a copy of a Petition for Decision and Brief in Support Thereof. We have discussed this matter at some length over the past few months with the Regional Solicitor for the Denver Regional Office of the Department of the Interior, Mr. Palmer King. All of the parties have agreed that this is an important and timely question that should receive a final administrative determination as soon as possible, and that a Petition in this form directed to you would best achieve these ends.





Honorable Burton W. Silcock, Director  
Bureau of Land Management  
October 25, 1972

Page Two

In view of the above, we feel that a final administrative decision issued as early as possible will benefit all of the parties. Any inquiries or comments with respect to any of the above or the enclosed Petition may be directed to either me or Messrs. Robert P. Davison or Randy L. Parcel of our Denver office.

Yours truly,

HOLLAND & HART

By Kenneth D. Hubbard  
Kenneth D. Hubbard

KDH:ap

Enclosures

cc - with enc.:

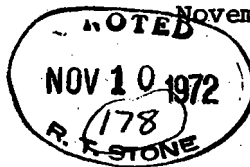
Mr. Palmer King, Regional Solicitor  
Mr. J. Elliott Hall, State Director of the Bureau of  
Land Management, Denver, Colorado  
Mr. Ralph Tingle, President of Bell Petroleum Company  
Mr. Reid T. Stone, Oil Shale Coordinator, Dept. of Interior  
Robert P. Davison, Esq.  
Randy L. Parcel, Esq.



1315 South Clarkson Street, Denver, Colorado 80210

Telephone 303 744-3175

TWX 910-931-2699



November 3, 1972

OFFICE OF

NOV 9 1972

HEARINGS & APPEALS

Mr. James M. Day, Director  
Office of Hearings and Appeals  
4015 Wilson Boulevard  
Arlington, VA. 22203

Dear Sir:

Pursuant to your request for written comments on the Draft Environmental Statement for the Department of the Interior's Proposed Prototype Oil Shale Leasing Program, we are enclosing the following documents:

- (1) A more fully annotated version of the statement made by me at the public hearing held in Grand Junction, Colorado on October 13, and
- (2) Suggested additions to the Final Environmental Statement in response to criticisms raised during the four days of public hearings.

It is our opinion that the Department has prepared an excellent environmental statement and that answers to many of the questions raised during the public hearings are already contained in the statement. Our intention here is to aid Interior in its preparation of the final environmental statement by identifying sections of the draft statement that essentially answer specific criticisms raised and by submitting additional information which may be used in responding to criticisms not addressed in the draft statement.

We thank you for the opportunity to submit our comments and hope they will be of value to the Department in preparing the final statement.

Sincerely,

Russell J. Cameron  
President

RJC:pr

Enclosures

COMMENTS ON DRAFT ENVIRONMENTAL  
STATEMENT FOR INTERIOR'S PROPOSED  
PROTOTYPE OIL SHALE LEASING PROGRAM  
IN RESPONSE TO CERTAIN QUESTIONS RAISED  
DURING PUBLIC HEARINGS HELD  
OCTOBER 10-13, 1972

Submitted By

Cameron Engineers  
Denver, Colorado

November 6, 1972

## PREFACE

These comments are additional to Cameron Engineers' presentation at the opening hearings on the Draft Environmental Statement and are intended to respond to certain questions raised at those hearings by others.

## CONTENTS

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Is the Draft Statement's Discussion of Salinity Problems in the Colorado River Basin Adequate? . . . . .	9
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QUESTION -- Should oil shale be developed on private lands before any public oil shale lands are leased?

RESPONSE -- This question ignores the specific objective of the prototype leasing program which is to provide, through the joint efforts of government and industry, solutions to the admittedly complex environmental problems of oil shale development. Under this program, lessees would provide full access to their facilities by authorized government personnel and would provide all information of an environmental nature, not only to government but to the public and other oil shale developers. Lessees would be obligated to meet environmental controls which are much more comprehensive than any yet proposed for mining and minerals development.

While oil shale development on private lands necessarily will be in compliance with applicable Federal, state and local laws and regulations, the private land owner is not under the same obligation to share information on the operations with government officials and the public.

Another aspect of development on private versus public lands is that only a few companies own prime quality oil shale reserves. Many of the financially strongest, most capable energy companies have no oil shale holdings. It seems only prudent for the Federal government, as owner of 80% of the oil shale lands, to afford the opportunity for those who wish to do so to participate in the pioneering phase of this industry and to provide input into the development of a viable, environmentally acceptable oil shale technology.

QUESTION -- Should the prototype leasing program be delayed until the joint Federal-State-Local-Industry oil shale environmental studies, being conducted in Colorado are completed?

RESPONSE -- This series of four studies is scheduled for completion by dates ranging from October 1973 to July 1974. The current schedule for the leasing program calls for the first lease to be issued in February 1973 at the earliest. Thus the first lease will be less than 1-1/2 years old by the time the studies are complete. Though the studies are being conducted specifically for Colorado's Piceance Creek Basin, much of the information will be applicable to development in Utah or Wyoming.

The first years of a prototype lease will be devoted to tract investigation operations, including public environmental studies, from which a detailed development plan will be compiled. This plan is to be submitted on the third anniversary of the lease, some 1-1/2 years after the subject environmental reports are completed. Thus the results of the studies will be available to Federal, state and local officials responsible for monitoring the program before tract development is scheduled to begin.

We suggest that Interior provide in the final statement further elaboration of the mutual compatibility of the prototype leasing program and the ongoing environmental studies.

QUESTION -- Isn't this a crash program of oil shale development and thus hasty action by the Interior Department?

RESPONSE -- Some people have characterized the current leasing program as "the sudden rush to develop oil shale," but a closer examination of events challenges this opinion.

Following is a chronology of events beginning in 1920 when oil shale was designated as a "leasable mineral".

#### CHRONOLOGY OF EVENTS RELATED TO FEDERAL OIL SHALE LEASING

1920--Leasing act made oil shale a leasable mineral with possibility for Federal government to get rent, royalties, and other income from shale development.

1930--Oil shale withdrawn from leasing "for the purposes of investigation, examination and classification."

1943--U. S. Bureau of Mines began oil shale research and development under the Synthetic Liquid Fuels Act.

1956--Bureau of Mines discontinued research work at Rifle but research at Laramie continues today.

March, 1963--Shell Oil Company applied to Interior for an oil shale lease. Four other applications were filed immediately thereafter. Interior was asked by industry to rescind the 1930 withdrawal order.

June, 1963--A study of the "Status and Problems of Colorado Oil Shale Development" was completed for the State of Colorado.

November, 1963--Interior Secretary Udall requested public participation in suggesting procedures for developing oil shale.



- December, 1963--Colorado Governor Love appointed an Oil Shale Advisory Committee which remains active today.
- June, 1964--Interior Secretary Udall received over 200 responses to his request for oil shale development suggestions.
- June, 1964--Secretary Udall appointed a 7-man blue-ribbon oil shale advisory board to recommend Federal oil shale policy.
- September, 1964--Public Land Law Review Commission (PLLRC) was created to study existing laws and procedures governing the administration of public lands including oil shale lands.
- September, 1964--Federal Oil Shale Advisory Board met in public session at Anvil Points, Rifle, Colorado.
- February, 1965--Federal Oil Shale Advisory Board submitted an interim report to Secretary Udall who released the report to the public and requested public comments.
- May, 1965--Senate Committee on Interior and Insular Affairs held hearings on oil shale to obtain Administration's views on oil shale development.
- March, 1966--Secretary Udall announced formation of a high level Interior Department energy group to assess prospects for petroleum supply between then and 1980 including the study of gas and liquid fuels from oil shale.
- June, 1966--PLLRC began a series of regional public meetings in Salt Lake City to obtain views on public land policy from all interested persons. Other regional meetings held in Denver and Albuquerque.

January, 1967--Secretary Udall announced a Federal five-point oil shale development program which among other things included provisional developmental leases of Federal land followed by commercial leases if research and development was successful.

February, 1967--Senate Interior Committee held public hearings on Federal oil shale development program.

May, 1967--Interior published proposed regulations governing oil shale leasing for research and development. Comments from the public requested.

April and May, 1967--Senate Subcommittee on Antitrust and Monopoly held hearings on the competitive aspects of oil shale development.

June, 1967--Interior extended by 60 days the time for receiving comments on proposed regulations published in May, 1967.

August, 1967--Interior extended for another 60 days the time available for public comment on proposed regulations.

September, 1967--Senate Interior Committee held hearings to consider public response to proposed oil shale leasing regulations.

May, 1968--After 8 months of study by an Interior task force, Interior released a report entitled, "Prospects for Oil Shale Development" which recommended a test leasing program. Three months were allowed for public comments.

May, 1968--The Public Land Law Review Commission awarded a contract to Denver University for an oil shale legal study.

September, 1968--A total of 26 comments on the report issued in May were received.

September, 1968--The 1968 oil shale leasing program was announced by Interior.

December, 1968--Three Colorado oil shale tracts of questionable quality were offered for lease by competitive bidding, but because too little time was available for tract evaluation, no serious bids were received.

June, 1969--Interior Secretary Hickel met with representatives of oil shale states to discuss oil shale development policy.

July, 1969--Denver University completed a "Legal Study of Oil Shale on Public Lands," for Public Land Law Review Commission.

October, 1969--Secretary Hickel began studies leading to the present oil shale leasing proposal. The events since that time (from Vol. I, pages VIII-1 to VIII-2) are listed below.

#### A. Past Planning Activities

October 1969 - An oil shale study was initiated by the Assistant Secretary--Mineral Resources and the Assistant Secretary--Public Land Management.

October-December 1969 - Review of Mineral Leasing Act and previous Departmental efforts to lease oil shale resources in public lands.

December 1969 - Oil Shale Task Force formally established to draft a prototype oil shale leasing program proposal and to implement a program if approved.

May 1970 - Proposed program presented to the Secretary of the Interior, who directed that additional environmental analysis be made prior to program implementation.

May-June 1970 - The Governors of Colorado, Wyoming, and Utah formed State Committees to study the environmental impact and related costs for appropriate environmental controls.

June 1970 - Public meetings conducted in each State on the proposed prototype leasing program.

August 1970 - Officials of private, State, and Federal agencies conducted a week-long field survey of sites typical of those that may be developed.

August 1970 - December 1972 - In the three-state area, 25 public oil shale meetings have been held.

February 1971 - State Governors formally transmitted to the Secretary of the Interior an evaluation of the environmental impact of oil shale development as related to the resources in their States.

March-June 1971 - Interior's preliminary draft environmental statement and program statement for a Prototype oil shale Leasing Program were prepared, and submitted for public inspection.

June 1971 - Informational core drilling authorized and carried out on public oil shale lands in Colorado, Utah, and Wyoming. Over \$2 million spent by private firms on 16 holes aggregating 24,647 feet of drilling for exploring and evaluating Federal lands prior to submitting nominations for leases by February 1, 1972. Surface area was restored and the entire operation was conducted without significant environmental impact.

September 1971 - Board of County Commissioners of Garfield, Rio Blanco, Mesa counties, Colorado create an Oil Shale Regional Planning Commission.

November 1971 - Department of Interior published notice of call for nominations of areas for oil shale leasing. Fifteen companies submitted 17 nominations on 13 separate tracts in Utah, 1 nomination on 1 tract in Wyoming. The 23 industry nominations on 18 separate tracts in the 3 states were supplemented by 2 additional tracts nominated by the Governor of Wyoming.

January 31, 1972 - Lease nominations were closed.

February-April 1972 - The nominated tracts were reviewed by a selection committee of Federal and State experts, in order to recommend a total of six tracts, two in each State, for competitive-bid leasing. The six recommended tracts were further reviewed by the Department of the Interior, and by representatives of the Governor's Task Force in each of the three States, and the final selections announced on April 25, 1972.

April-September 1972 - Revised draft environmental statement was prepared by Interior and published in three volumes: (1) A regional overview of the expected environmental impact of a prototype oil shale leasing program and the projected impact of a mature 1 million barrel per day shale oil industry; (2) a discussion of other energy sources which may be considered as alternatives to the development of oil shale; and (3) an analysis of the impact of development of six specific proposed lease tracts.

QUESTION-- Have alternatives to the six tracts selected for the prototype leasing program been adequately considered?

RESPONSE-- The draft environmental statement does address the subject of alternative tracts; some 97 pages are devoted to this purpose, beginning on page IX-4, Volume III. A total of 21 tracts were nominated by industry in Colorado, Utah and Wyoming. The most reasonable alternatives to the six tracts selected are considered by Interior in the draft statement to be the 15 tracts nominated but not selected, a logical conclusion. Summaries of data pertaining to the 15 unselected tracts are presented in the draft statement, together with reasons why the tracts were not selected. We suggest that Interior include summaries of the six selected tracts in Chapter IX, Volume III of the final statement along with reasons why these tracts were selected over the other 15.

QUESTION -- Is the Draft Statement's discussion of salinity problems in the Colorado River basin adequate?

RESPONSE -- The draft statement projects that a 1,000,000 B/D shale oil industry supplied with water entirely from surface sources could increase Colorado River salinity from 0.8 to 1.4%. The use of ground water for a part of the industry's requirements is mentioned, but the beneficial effect of this possibility was not considered in arriving at the above figures.

Nor is the salinity problem in the Colorado River solely an oil shale problem. Any diversion of high quality water from the river system tends to increase the salinity in the remaining water. Measures to reduce salinity to acceptable levels are under intensive study by various government agencies. These agencies are considering not only man-made salinity, but also natural sources which are the origin of two-thirds of the salt load that now concerns us.

Listed below are three publications which speak to the salinity problem of the Colorado River. Not only are the problems of salinity discussed but approaches to their solution are suggested.

1. Senate Interior Committee Report, "Problems of Electrical Power Production in the Southwest," September 1972, pp. 260-261.
2. U. S. Environmental Protection Agency, Regions VIII and IX, "The Mineral Quality Problem in the Colorado River Basin--Summary Report," 1971.
3. U. S. Department of the Interior, Bureau of Reclamation, "Colorado River Water Quality Improvement," February 1972.

QUESTION -- How can development resulting from this program be curtailed if solutions to environmental problems cannot be found?

RESPONSE -- The prototype program is designed to not only insure that environmental impacts will be minimized, but to provide the means by which development can be stopped if adequate environmental control cannot be achieved.

A company bidding on a tract must present with its bid a preliminary plan describing the type of development envisioned to be most suitable for the tract in question and defining steps that would be taken before choosing the ultimate development plan.

Each lease issued will contain stipulations specifically tailored to individual tracts -- stipulations defining what can and cannot be done on that tract and what must be done to protect the environment. The stipulations could be toughened in the future if necessary. The stipulations would supplement local, state and Federal air and water quality standards. Development would also be subject to Federal regulations (43 CFR part 23 and 30 CFR part 231) dealing with exploration, production, mining and reclamation of lands administered by the Interior Department. If existing local, state and Federal regulations could not be met, operations would cease until compliance was achieved.

After a lease is issued, a lessee would be required to initiate extensive monitoring programs to determine if environmental protection measures are adequate or if changes are required. Such monitoring would include surveillance of wildlife and its habitat and air and water quality.

Within three years after a lease is issued, a lessee would be required to submit a detailed plan of development to the Interior Department. Only after public hearings and consultation with state and local officials would the plan be approved, and only then after necessary changes had been made. If the plan, as submitted, was unacceptable to Interior, it would be reworked. And it would continue to be reworked until it was acceptable. Large scale development could not occur until solid guarantees of environmental protection were provided.

If the lands for which leases were issued during this prototype program could not be developed in a manner consistent with environmental integrity, no development would occur and no further leases would be issued until environmental protection could be assured.



STATEMENT BY RUSSELL J. CAMERON, PRESIDENT, CAMERON ENGINEERS, INC., DENVER, COLORADO FOR PRESENTATION AT PUBLIC HEARINGS ON DRAFT ENVIRONMENTAL STATEMENT CONCERNING THE DEPARTMENT OF THE INTERIOR'S PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM, OCTOBER 13, GRAND JUNCTION, COLORADO.

Cameron Engineers is a consulting organization that has long participated in efforts by industry and government to bring to beneficial use the energy resources that exist in the world's oil shale deposits. We welcome this opportunity to state our views on the Prototype Oil Shale Leasing Program proposed by the Department of the Interior.

The Department is to be commended for its thorough treatment of the environmental consequences of oil shale development. Not only are the impacts of the prototype leasing program detailed, but the statement provides a projection of the environmental effects of a mature oil shale industry at a point many years in the future. Since the purpose of the prototype program is to provide guidance for the ultimate development of the resource a glimpse at the impacts of large scale production is useful, even though difficult to visualize at this point in time.

#### NEED FOR SHALE OIL

##### Urgency

The need for shale oil is well documented in that portion of the statement dealing with energy alternatives [Volume II]. However, our own studies of the energy posture of the U.S. do not lead us to be as optimistic as some of the sources quoted regarding the potential for domestic oil or our continued access to foreign petroleum on acceptable terms. We therefore

attach more urgency to the initiation of the prototype leasing program and the subsequent commencement of significant levels of shale oil production than I interpret from the Statement.

#### Domestic Petroleum Potential

I cannot agree, for instance, with the suggestion that our "Indicated [petroleum] reserve plus undiscovered resources producible with current economics and technology" total 417 billion barrels.<sup>1/</sup> The qualification "once they have been found" contradicts the implication that current economics apply. This figure is pure geological speculation and has little relevance to the period under consideration. The Department's own projections and those of others indicate that we probably will be unable to maintain even current levels of oil production over the next 15 years and this is what is relevant.

#### Imports

Because of the long lead-time to develop any of our large new energy resources, we seem inevitably to turn to imports of oil and gas as the only immediate solution. The Statement clearly points out the hazards of this course [Volume II, pp. 44-49]. It is my personal opinion that we will be denied much of our present access to imported fuels within 5 years by a combination of economic and political factors.

#### Regional Oil Supply

I would like to mention another aspect of the need for shale oil. The Rocky Mountain area has been a traditional

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<sup>1/</sup> Draft, Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, Vol. II, pg. 27

supplier of oil to other parts of the nation. Today, despite renewed emphasis on exploration, oil production in the states of Colorado, Montana, Utah and Wyoming is in decline, production having peaked in 1961 at 693,000 B/D.<sup>2/</sup> Output in 1971 was 657,000 B/D with no shut-in capacity. Colorado production in 1971 was less than one-half its 160,000 B/D maximum reached in 1956, due largely to dwindling production in the Rangely field.

Production is in decline as the demand for petroleum products in these states is beginning to exceed the supply. Spot shortages of gasoline occurred in Denver over the Labor Day holiday. On October 8, there was an announcement in the Denver Post of a \$20 million 80,000 B/D products pipeline from Kansas to Denver. Industry sources already have noted that pipeline connections are being made to bring foreign crude to Oklahoma and Kansas refineries, thus the Rocky Mountain area will soon be burning fuels from sources as much as 10,000 miles away. You can be sure that Libyan gasoline will not be cheap.

#### GAS AND ELECTRIC POWER FROM OIL SHALE

In our capacity as consultants we serve suppliers of energy such as gas and electric utilities as well as energy producers. Thus we are well aware of the problems of providing the nation's ever growing demand for these clean and convenient forms of energy.

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<sup>2/</sup> "Forecast/Review", Oil and Gas Journal, January 31, 1972, pp. 81 - 100 and U. S. Bureau of Mines, Minerals Yearbooks for various years.

Electric power is the ideal type of energy for the ultimate consumer. It is instantly available and virtually pollution free. Gas is a close second in both convenience and environmental acceptance, and is lower in cost than electricity. Together they pair well to bring the householder the best combination of efficiency and economy.

A major problem in providing the nation's needs for electricity is that the dominant fuels for power plants, high sulfur coals and fuels oils, contribute heavily to air pollution. Natural gas also is an important electric utility fuel, one that has minimum environmental impact, but natural gas is in short supply and its use for power generation is being restricted. In some areas even high priority household and commercial needs for gas cannot be met.

Currently, methods to remove sulfur from power plant stack gases still are in an experimental stage. Nuclear energy is not yet an important factor in our electric power supply and while there are various nuclear plants in operation or under construction or planned, nuclear energy cannot be a really significant factor until a breakthrough on the breeder reactor in the late 1980's.

The immediate solution to the fuel pollution problem of the electric utilities is fuel substitution - low sulfur coals and fuel oils for the high sulfur fuels. However, supplies of low sulfur fuel oils also are limited and for the most part must be imported. Even foreign supplies of low sulfur crude oil may well be insufficient to meet global demands for a cleaner environment.

The gas problem may be even more critical. Gas reserves have been declining for several years and deliverability is less than demand in many areas. New sources are being sought in a multitude of ways. There is accelerated exploration in

traditional gas producing areas, as well as the Arctic, the outer Continental shelf and in ultra-deep basins. Several supplemental gas sources are under development - imported liquefied natural gas (LNG), nuclear stimulation of tight gas formations, coal gasification, and the reforming of petroleum liquids. None of these potential sources alone is the answer.

The near-term solutions will be new gas discoveries in the 48-states supplemented by LNG and the reforming of petroleum naphtha. Some LNG is now imported and at least 20 naphtha gasification plants are in the planning or construction stages. Unfortunately both LNG and naphtha for the most part, will come from foreign sources.

We see an important role for oil shale in providing both domestically produced electric utility fuel and a supplement to natural gas. Shale oil can be processed to an extremely low-sulfur, clean-burning fuel oil. A coproduct of this operation is a light naphtha convertible by reforming into gas equal in quality to natural gas. Oil shale thus can contribute to the solution to environmental problems as well as clean fuel shortages throughout the country.

#### ENVIRONMENTAL CONSIDERATIONS

Oil shale development will cause local and regional impacts on the existing environment. The Department of the Interior recognizes this fact. So does industry.

More people and increased urbanization in a predominantly rural area is inevitable. Some land now used primarily for domestic stock grazing or which has its chief utility as habitat for wildlife will be committed to other uses. Wildlife and,

to a lesser extent, fish will be affected by some loss of habitat.

Significant quantities of water will be consumed by an oil shale industry but no water dedicated to other uses will be required. Water quality will not be affected except for slight increases in salinity that only indirectly are a result of oil shale activity. Much of the water needed can be of a lower quality than is usable for domestic or agricultural purposes.

One cannot light a match without affecting air quality. An oil shale industry will add to the emissions already passing through the Piceance Creek, Uinta or Washakie Basins. However, air quality standards established by law will be met from the beginning. With nothing to correct, air quality should be maintained at the highest levels attainable for industrial communities.

In its effort to be even-handed, we believe the Department has been overly cautious in some of its assessments. For instance,

- Changes in land use are not necessarily bad. The oil shale area has been used by man for many years for a variety of purposes, such as hunting, livestock grazing, oil and gas exploration and development. Although remote, the area can scarcely be called semi-wilderness, as much of the landscape has been altered since man first arrived on the scene. Except for deer hunting, the area has never been popular for most recreation uses.
- Impact on local communities should be beneficial since much of the region has been declining economically

for several years. The tax base, payrolls, and job opportunities should stimulate those communities.

- Health and safety should be improved in oil shale plants and mines built to contemporary standards and in any case should not be compared to coal mining. The copper industry is more akin. Deaths in the mining, milling and smelting of copper for the entire country averaged 21 per year from 1967 to 1970<sup>3/</sup>. It is completely fallacious to suggest that 1100 deaths could result from oil shale mining through 1985, [Volume I, pp. III-87].
- There is no justification for a prediction that deer hunting will be damaged by oil shale development. Even urban areas such as the State of New Jersey have been able to maintain indigenous deer populations under heavy hunting pressure.

Owing to factors discussed elsewhere, (see page 11), we think it unlikely that shale oil production in the three-state area will exceed the 400,000 to 500,000 barrel per day range by 1985. Therefore, the magnitude of the impacts would be only one-half of that estimated in the environmental statement for 1985.

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<sup>3/</sup> Source: U. S. Bureau of Mines

Another point we wish to mention concerns the predicted salinity in the Colorado River for a 1,000,000 B/D industry. While we do not question the assumption that the concentration of salts in the river could increase, we feel that the relative importance of the minor increase that theoretically could take place should be examined in the proper perspective.

An oil shale industry could cause an increase in salinity in two ways:

- (1) discharge of low quality water, whether it be contaminated runoff, waste water from retorting or upgrading plants, or excess mine water, into surface streams, and
- (2) consumptive use of relatively fresh water from Colorado River tributaries.

The first source of pollution can be totally controlled; legally, it must be controlled or there will be no oil shale industry. Thus, it is entirely valid to rule out discharge of low quality water as a cause of water pollution. Unless this water could be adequately treated so that it could be discharged directly to surface streams, other disposal methods would be used -- such as evaporation, recycling to extinction, or injection into suitable aquifers. Actually, it would be used for solid waste disposal, as is pointed out in the Statement.



Any increase in Colorado River salinity caused by oil shale development would be due solely to the concentration effect of removing high quality water that would otherwise serve to dilute lower quality water entering the river elsewhere. The fact that consumptive use of water increases the salt concentration in the Colorado River doesn't apply just to an oil shale industry. Any further consumptive use of fresh water anywhere in the Colorado River basin, for any purpose, would increase salt concentration downstream from the diversion point, unless that water diverted and consumed had a higher concentration of salts than the river at that point.

A report issued in 1971 by the Environmental Protection Agency shows that 66 percent of the salt load at Hoover Dam is caused by natural sources, 33 percent by irrigation and only one percent by existing municipal and industrial uses. The present concentration of salts at Hoover Dam averages 730 milligrams per liter. The increase caused by oil shale development is predicted in the environmental statement to amount to 6 to 10 mg/l for a one-million barrel per day industry or about one percent of the current salinity [Volume I, p. III-39]. By contrast, the current salinity in the river increases to about 870 mg/l at Imperial Dam and is over 1100 mg/l as it flows into old Mexico<sup>4/</sup>. Most of the 400 mg/l increase below Hoover dam is caused by agricultural practices in Arizona and California.

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<sup>4/</sup> United States Environmental Protection Agency, Regions VIII and IX, "The Mineral Quality Problem in the Colorado River Basin - Summary Report," 1971.

## ENVIRONMENTAL STUDIES

Neither the Department of the Interior nor industry is approaching oil shale development oblivious to concern for the environment. As a matter of fact, the record shows exactly the opposite. We recognize the unique opportunity to create an industry that will include environmental quality controls from the very beginning. No other American industry has ever had that opportunity. Industry does not intend to lose the opportunity nor do we intend to shirk the responsibility that is incumbent with us to protect the environment. Considerable sums of money have already been spent for research aimed at providing solutions to environmental problems, and much more will be spent before the first barrel of shale oil enters a pipeline.

The Colony Development Operation is generally regarded as being closer to commercial scale oil shale development than any other company or industrial group involved in oil shale. Colony has conducted environmental studies for several years in conjunction with their prototype mine and retorting facilities near Grand Valley, Colorado. On numerous occasions, officials of the companies participating in this operation have publicly stated that their studies indicate environmental problems can be overcome and that the cost of environmental protection is not prohibitive. They have conducted numerous tours of the Parachute Creek plant and mine for people from all walks of life -- from local ranchers to nationally recognized ecologists. Most have been impressed with their environmental programs.

More recently, the Colorado State Department of Natural Resources, in cooperation with the Interior Department, the

Environmental Protection Agency, local governments and 15 private companies, launched a two-year, \$715,000 study aimed at further defining environmental impacts that could be expected with oil shale development and providing basic data for solutions to any environmental problems. These studies will be completed prior to the time that the lessee must submit his detailed development plan.

Other studies concerning socio-economics resources and spent shale have been conducted over the years by Colorado State University and Denver Research Institute. Local land use planning is underway with the recent creation of a three-county regional planning commission in Colorado.

The draft environmental statement's description of these various studies [Volume I, p. I-75] merely reinforces the fact that the Department, industry, and public institutions have accepted the challenge of developing oil shale in a manner such that environmental quality will be maintained and the social ambient will be such as to attract a better, more productive worker.

#### A NATIONAL GOAL FOR OIL SHALE

In its treatment of the alternatives and of the environmental impact of large-scale development the Department has used a shale oil production level of 1,000,000 B/D to be attained by 1985. Convincing evidence is presented of the need for an energy input of this magnitude.

My concern is that under present conflicting policies and courses of action this target will not be reached. The prototype leasing program, although essential, is only one small step. Twenty 50,000 B/D plants, or their equivalent in larger units, will be needed.

The capital markets must supply in excess of \$5 billion for a 1,000,000 B/D industry. Under current economic conditions within the petroleum industry this is unlikely to be done in the short space of 12 years.

If it is in the national interest to obtain 1,000,000 B/D (5% of our petroleum needs) from oil shale by 1985, and we believe this to be the case, then there must be a national goal to do so. Such a goal should be part of a national energy policy that provides for the use of secondary energy resources before primary reserves are exhausted. We must rapidly accelerate the time to acquire fundamental, environmental, technical and economic data. To do this there will need to be a sharing of the risks and the costs by industry and government.

While the above is not directly the subject of this inquiry it seems to me to be basic to any consideration of the development and use of oil shale. Unless we are prepared to solve the other problems that face oil shale there is little benefit from an effort to find means to ameliorate environmental impacts.

#### CONCLUSION

The need for shale oil has been amply justified not only in the Department's statement, but by literally dozens of studies over the past decade.

The draft environmental statement is thorough in its identification of impacts but most importantly, it describes effective procedures by which those impacts would be minimized. We are confident that oil shale will be developed safely and with due concern for environmental factors.

The program has adequate safeguards. If the lands for which leases are issued during this program could not be developed in a manner consistent with environmental integrity, no development would occur and no further leases would be issued until environmental protection could be assured. Industry knows these conditions and we believe is willing to accept them.

We urge the Secretary to proceed with the program as defined in the draft statement without delay.

Colony Development Operation  
1500 Security Life Building  
Denver, Colorado 80202  
Telephone 303 266 3741

LETTER NO. 58

John S. Hutchins  
Manager

October 31, 1972

Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

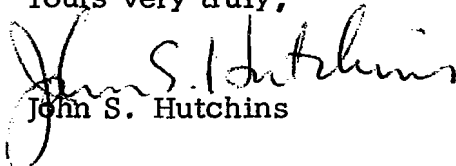
Federal Prototype Oil Shale  
Leasing Program

As indicated in my oral testimony at the subject hearing in Denver on October 10, I submit herewith Colony's written comments on the Draft Environmental Statement, together with several presently completed reports on specific environmentally related subjects to supplement these written comments.

Both Atlantic Richfield Company and The Oil Shale Corporation participated and supported Colony with input and review of these written comments.

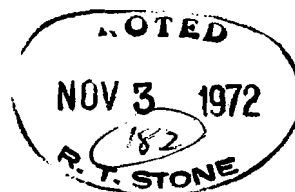
These comments are in no way intended to be critical of the fine work done by the Department of the Interior in preparing their draft statement. Rather I feel that because of our own extensive experience in oil shale we are in an excellent position to supplement the Department's Draft Statement which we view as an excellent and well thought out basic document.

Yours very truly,

  
John S. Hutchins

JSH:hs

w/Attachments



cc: Mr. Reid Stone - Washington, D.C.

Development Engineering Incorporated ■ 1827 GRANT STREET, DENVER, COLORADO 80203 ■ PHONE: 303 825-7249 CABLE CODE: DEVENG DENVERCOLO, USA

November 6, 1972



Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

We have reviewed the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program and our representatives attended the Denver, Colorado, public hearings. Presented herein, for your consideration, are a few of our thoughts.

The program proposed is a good one as data from different types and grades of oil shale from varying types of terrain will be obtained at no cost to the taxpayer and will benefit the economy of the oil shale areas. Furthermore, the environmental and cost information collected will permit the formulation of sound policies for utilization of the large quantities of energy stored in the oil shale reserves.

Many words have been used to try to convince everyone why large scale oil shale testing should be delayed. A major motive for the negative approach used to try to solve the country's energy problems appears to stem from the widespread disease of "have George solve the problem but don't let him do the necessary work in my neighborhood." Our education system (parents and educators alike) apparently has failed to properly report to the people that it is the vision, initiative and willingness of the individual to work hard that has created the level of economy we have in the U. S. today. This vision and initiative located and developed the large reserves of cheap energy required to provide the material things we enjoy in everyday life. To maintain this level of economy, our country must call upon all of its scientific ability to develop technologies to utilize atomic energy, sun, winds, tides, additional fossil fuels and all other sources of energy available to mankind.

Mr. Reid Stone  
Department of the Interior  
November 6, 1972  
Page 2

Fossil fuels have been the workhorse supplying our energy needs in the past and are expected to continue this role for some time. In examining fossil fuel reserves, it is interesting to note that oil shale is second only to coal. Also, there are few places in the U. S. where commercial oil shale operations will have less impact on mankind and his environment. Present information indicates that commercial operations can be conducted within the established environmental guidelines.

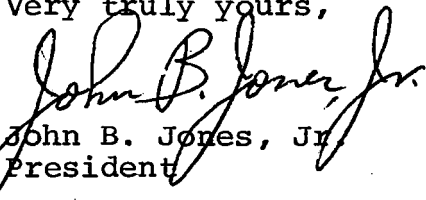
Oil shale development work has been going forward in many laboratories and pilot plants since before World War I. As a source of clean burning fuel, experts now indicate oil shale is nearer to being both technologically and economically feasible than coal, tar sands and the like. These are ample reasons for the development effort on oil shale to be expanded and accelerated. The technology has reached the stage of development where little more fruitful research can be accomplished prior to starting field testing of large size equipment. For example, there is much laboratory data on the characteristics of retorted shale. However, the only way to determine its piling, weathering and leaching characteristics is to retort significant quantities in equipment capable of duplicating a commercial plant's operating conditions.

The Draft Environmental Statement does not cover one important point. Since the amount of particulates in the air, water salinity, etc., will vary with the seasons, environmental "baseline" information for each month of the year is needed for each of the proposed lease sites so the true environmental impact of the oil shale operation can be determined.

We are convinced that your leasing program is a good route to determine the economic feasibility of using oil shale to supply part of our country's energy needs and we recommend that the program be expedited.

Thank you for providing an opportunity for us to comment on this statement.

Very truly yours,



John B. Jones, Jr.  
President

JBj:sm



**Diamond Shamrock Oil and Gas Company**

A Unit of Diamond Shamrock Corporation

FIRST NATIONAL BANK BUILDING, POST OFFICE BOX 631, AMARILLO, TEXAS 79105

November 7, 1972

AVERY RUSH, JR.  
PRESIDENT

U. S. Department of Interior  
Mr. Rogers C. B. Morton  
Secretary of the Interior  
Interior Building  
Washington, D. C. 20240

Re: Proposed Prototype Oil Shale  
Leasing Program

Dear Mr. Morton:

Diamond Shamrock Oil and Gas Company, a Unit of Diamond Shamrock Corporation, is an integrated producer engaged in exploring for, developing, transporting, refining and marketing of natural gas, petroleum and petroleum products. We have joined with six other independent oil and gas companies and with Geokinetics Inc., to form United Shale Oil Company (USOCO) for the general purpose of studying the feasibility of the recovery of oil shale from shale oil lands and to attempt to secure one of the six Federal oil shale leases to be made available under the proposed prototype oil shale leasing program.

As stated in the draft environmental statement, the goal of the Department of the Interior's proposed prototype leasing program is "to provide a new source of energy for the nation by stimulating the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment while providing for the restoration of the immediate and surrounding area." We support this goal and believe that this program is an important step toward developing a new source of needed energy.

The plan of our group is to investigate primarily the development of in situ methods for shale oil recovery. We believe that our group, with the expertise of Geokinetics Inc., could furnish valuable information needed to fully investigate this method of recovery. It now appears that the granting of the leases will be only on the basis of the highest bid with no provision for granting leases based on developing new technology for the economical recovery of oil from oil shale.

U. S. Department of Interior

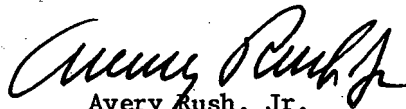
-2-

November 7, 1972

The development of a viable, profitable shale oil industry would provide great advantages which would far outweigh the advantages to be obtained from the bonus and in relation to these advantages, the bonus would be minimal. As stated previously, our group is interested in developing new techniques for extracting shale oil other than by the use of conventional mining and surface retorting methods. In order to develop these processes, we would economically be excluded from paying a large bonus for a lease on which to experiment and would inevitably be out bid by those who plan to use conventional technology which has essentially been proven.

We would ask that you reconsider the proposed plan of leasing in order that bids by a company or group of companies based on a work program involving the developing of new technology would be considered in awarding one of the shale oil leases.

Respectfully submitted,

  
Avery Rush, Jr.

gj

**GEOKINETICS INC.** minerals exploration and development

suite 300 • central valley national bank bldg. • 1875 willow pass road • concord, california 94520 • telephone (415) 689-4461

October 12, 1972

Mr. Rogers C. D. Morton  
Secretary of the Interior  
Interior Building  
Washington D. C. 20240

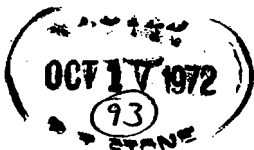
Dear Mr. Morton:

Enclosed are the comments of Geokinetics Inc. on the Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program issued by the Department on September 7, 1972.

We believe the Department's proposed plan to sell the leases to the highest bidder will: (1) result in a monopoly in the oil shale industry; (2) make it impossible for the smaller oil companies to participate in the oil shale industry; and (3) discourage development of oil shale technology.

We urge you to change the procedures for granting the leases so as to:

1. Provide that those companies that do not have oil shale lands have priority in securing leases over those that already hold adequate lands.
2. Guarantee that independent oil producers can be represented in the new industry.
3. Encourage research and development of in-situ technology.



Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Mitchell A. Lekas'.

Mitchell A. Lekas  
President

Enclosure

COMMENTS OF GEOKINETICS INC.  
on the  
PROTOTYPE OIL SHALE LEASING PROGRAM  
DRAFT ENVIRONMENTAL IMPACT STATEMENT

October 9, 1972

Geokinetics has been requested by the Department of the Interior to comment on its Draft Environmental Impact Statement for the Prototype Oil Shale Leasing Program.

We fully support the goal of the Program as stated in the Environmental Statement as follows:

"The goal of the Department of the Interior's proposed prototype leasing program is to provide a new source of energy for the Nation by stimulating the timely development of commercial oil shale technology by private enterprise, and to do so in a manner that will assure the minimum possible impact on the present environment while providing for the future restoration of the immediate and surrounding area."

However, we find that the proposed procedures for awarding the leases are contrary to the goal of the program, and in various ways would be harmful in establishing a healthy, competitive and technologically advance oil shale industry.

In the proposed procedure, the leases would be sold to the highest cash bidder. No other consideration would be involved other than certain general guidelines to protect the environment.

We feel that procedures should be developed by Interior, and incorporated into the selection procedure, to achieve the following objectives:

-2-

## OBJECTIVE I

Guarantee that independent oil producers are represented in this new industry, and that it does not become a monopoly of the major oil companies.

## OBJECTIVE II

Provide that those companies that lack adequate reserves of oil shale land have priority in securing leases over those that already hold adequate oil shale reserves.

## OBJECTIVE III

Encourage testing and development of In-situ technology that would minimize surface impact, and could lead to lower cost oil for the consumer.

We wish to comment further on these objectives. The purpose of the leasing program, as stated in the Impact Statement, is to provide oil shale land to industry in order that industry may develop commercial oil shale technology. Only six leases are offered, and of these, most of the interest centers on two leases in the Piceance Creek basin of Colorado. As an indication of the interest in the Colorado leases, of 23 sites nominated by industry, 17 were in Colorado. The entire industry is competing for these very few tracts. It is imperative, therefore, that the leases be distributed in such a way as to guarantee the objectives of the program rather than that they be sold to the highest bidders.

## OBJECTIVE I

Various major oil companies control practically all of the non-government oil shale land in the area. They have enormous financial resources and can offer cash bonus bids that no independent or group of independent oil companies could hope to match. Since the number of desirable leases is very limited, the result of the Proposed bidding procedure would be to put the new industry entirely into the hands of the major oil companies that already control the private oil shale land. Since the program announcement states that there will be "no further leasing of government lands for an indefinite period of time", these few companies will have established effective control of the oil shale industry and all others would be excluded.

## OBJECTIVE II

In many cases the private oil shale lands have been held for many years by major oil companies that have made no determined effort to put the lands into production. There are other companies without oil shale lands that wish to acquire leases. Those who already have oil shale lands do not need more to carry out a development program. Therefore, those without lands should have priority in the granting of the leases.

## OBJECTIVE III

There are companies interested in developing new techniques for extracting shale oil other than by the use of conventional mining and surface retorting methods. A company that

-4-

wishes to develop an unproven process cannot pay a large bonus for the land on which to experiment, for it has no way of knowing at the inception of the work if its technique will be successful. Such companies must inevitably be outbid by those who plan to use conventional technology. Thus the program allows no opportunity for the development of an in-situ technology that would permit oil extraction with minimum damage to the surface, and that could lead to lower cost oil for the consumer.

Room and Pillar mining has been demonstrated in four large oil shale mines in the Piceance Creek basin and there are many large blocks of land controlled by major oil companies that are more amenable to this method than any of the six sites being offered for lease. Therefore, none of the limited number of Federal leases should be granted for purposes of Room and Pillar mining as there are already adequate lands suitable for this purpose in the hands of the industry.

LETTER NO. 62

OFFICE OF

NOV 10 1972

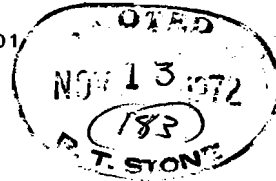
# HUMBLE OIL & REFINING COMPANY

POST OFFICE BOX 2180 • HOUSTON, TEXAS 77001

November 7, 1972

EXPLORATION DEPARTMENT  
EASTERN MARINE DIVISION

C. S. FLEISCHMANN  
MANAGER



Draft Environmental Statement  
for the Proposed Prototype  
Oil-Shale Leasing Program

Director,  
Office of Hearings and Appeals  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Sir:

Reference is made to Draft Environmental Statement for the Proposed Prototype Oil-Shale Leasing Program. Much of the Statement reflects the thorough in-depth study which the Department makes in connection with all of its environmental statements; however, we do wish to take exception to comments beginning on Page 95, Vol. II, "C. Alternative Energy Sources, a. Offshore Production." We note in particular as follows:

- (1) The Department has overstated the adverse environmental impact that could accrue from increasing offshore production. It is recognized that Industry operates in a difficult environment in the offshore. The Statement, by emphasizing the negative in a hypothetical manner, fails to give a balanced picture of Industry's operating history. This could contribute to a delay in the exploration and development of the offshore, which is considered highly prospective for gas as well as oil. We believe a reference to the recent Impact Statement on the Proposed General Louisiana Sale more properly provides the detailed analysis of the environmental impact of this alternative. Any attempt to synopsize that statement would, of necessity, require the briefing of every paragraph, if not every sentence, thereof. Unless this is done, it is suggested that a mere reference to such statement, or simply incorporating it, by reference, into the Draft Statement, is the only alternative that will not be prejudicial.



Director,  
Office of Hearings and Appeals  
Page 2

November 7, 1972

- (2) The discussion of increased offshore production as an alternative to the oil-shale program, questions Industry's capability to explore and develop additional offshore acreage. We do not share the concern on this point. The acreage limitation placed on sales is contrary to Industry's recommendations and was put into effect by the Department of the Interior for purposes other than meeting the Nation's energy requirements. We believe that Industry has the capability to increase the offshore exploration and development effort. Since great uncertainty exists in the forecasting of the production of oil, both from the offshore and from oil-shale, the energy shortage makes it imperative that these programs be developed concurrently. Each development represents a different technical and logistical problem. Neither should be advanced at the expense of the other.

May we, therefore, respectfully suggest that the Final Impact Statement recognize the need for both increased offshore production and a viable oil-shale leasing program in the light of our energy crisis, that both can be accomplished with proper regard for the environment, and that both are critical to a 'high standard of living and a wide sharing of life's amenities'.

Very truly yours,

*C. J. R. Rischmann*

WMS/nh



October 19, 1972

Rogers C. B. Morton, Secretary  
U. S. Department of Interior  
Office of the Secretary  
Washington, D. C. 20240

Re: Oil Shale Leasing Program Proposal  
Environmental Impact Statement

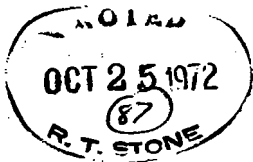
Dear Mr. Secretary:

We have recently acquired a copy of your draft titled "Environmental Statement for the Proposed Prototype Oil Shale Leasing Program" in three volumes, issued the 7th day of September, 1972. In Volume II you invite written comments on this draft.

From our examination of the above material, we conclude that your plan proposes to sell leases on the old "high bonus bid" basis with the addition of necessary environmental control. On this experimental exploration venture, we believe that the plan will probably have a discouraging effect on the development of much needed oil shale technology, particularly where smaller companies are concerned. There are many very capable small, oil oriented, companies which have at their disposal the resources to develop this much needed technology but are not capable of competing with major company bids. These smaller companies should be afforded the opportunity to exercise this ability. We would encourage you to consider some method of providing for participation in this program by these smaller so-called independent oil companies. In addition to the foregoing, it is our belief that participation by smaller companies would also lessen the chance for monopolistic tendencies to develop in this industry.

Investigation reveals that most of the available privately owned lands are already held by major companies and have been for some time. Obviously the mere leasing for oil shale by large companies has not resulted in any major breakthrough in economical commercial production.

We think that Interior should also give encouragement to research and development of experimental in-situ programs. This



Rogers C. B. Morton, Secretary  
U. S. Department of Interior  
October 19, 1972  
Page 2.

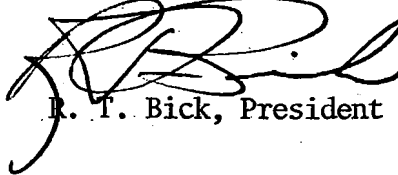
**KOCH EXPLORATION COMPANY**  
WICHITA, KANSAS

63

could lead to substantial positive results in production at lower costs to the consumer. It is believed that this method would also hold surface impact to a minimum.

We do heartily support your effort to provide a new source of energy for our nation, developed by private industry, while assuring a minimum impact on the environment at the source location.

Sincerely yours,



R. T. Bick, President

LMC/bks



## MARATHON OIL COMPANY FINDLAY OHIO 45840

PRODUCTION - UNITED STATES AND CANADA

G. R. SCHOONMAKER  
VICE PRESIDENT, EXPLORATION

October 12, 1972

Oil Shale Coordinator  
U. S. Department of Interior  
Room 7000, Interior Building  
Washington, D.C. 20240

Gentlemen:

RE: DRAFT ENVIRONMENTAL STATEMENT  
FOR THE PROPOSED PROTOTYPE OIL  
SHALE LEASING PROGRAM

This Program is being proposed in consonance with the President's Clean Energy Message of June 4, 1971, wherein he requested the initiation of "a leasing program to develop our vast oil shale resources, provided that environmental questions can be satisfactorily resolved."

The development of all domestic energy supplies is needed to fulfill the following apparent national goals:

- 1) Adequate energy for continued economic advancement.
- 2) An acceptable level of reliance on foreign energy sources.

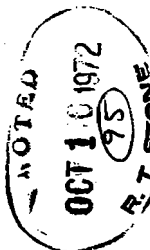
Those two objectives should be met with a rational consideration among the factors of environment, economics, and dependability of supplies for the consumer.

The National Petroleum Council in the interim report of July, 1971, U. S. Energy Outlook: An Initial Appraisal 1971-1985 points out that unless substantial improvements occur in economic conditions and government policies, this Nation will be dependent upon foreign sources for 57% of its oil requirements by 1985. The bulk of this foreign oil would have to come from the Middle East and North Africa.

It is questionable whether this Nation is capable of maintaining its economic and diplomatic initiative under such a degree of energy dependence.

Given these considerations, we laud the proposed Oil Shale Program which provides a reasonable approach to test the viability of this energy source.

We must not lose sight of the fact that the proposed Oil Shale Program is being undertaken to test the following premises:



October 12, 1972

- 1) The economic and technical feasibility of mining and conversion of the oil shale to a useable synthetic liquid or gaseous hydrocarbon.
- 2) The adequacy of the proposed bidding and leasing policy.
- 3) The impact of the proposed mining and conversion systems on the environment.

We would, particularly, like to comment on the last item. It must be emphasized that this Program is a prototype, in which a very small amount of land has been carefully chosen in order to quantify certain unknown factors. The entire rationale behind the proposals is to take these six tracts, which are representative of various potential recovery techniques, and test oil shale technology and environmental effects. Therefore, the Interior Department has reduced the amount of acreage to an absolute minimum and dispersed that amount over the vast expanse of three states in order to truly test the Program in a microcosm. This is an example of long-range planning and a scientific approach to a balanced solution for unlocking the oil shale resources.

We firmly believe that the operations under the prescribed conditions on limited acreage are capable of being conducted with minimal long-term effect on the environment. Even more to the point, we feel that it would be a major error to abort the potential development of this new and vital industry by premature condemnation of a program designed to develop and perfect technology and to ascertain the vital environmental data. All this information will be important in developing the vast oil shale resources so that they may become part of the reserves and production so sorely needed in helping to meet our Nation's energy requirements.

The lead time required in the shift of all forms of energy from resource to reserve and production categories is always great but it will be particularly long in oil shale since new technology and methods must be developed. Any commercial production resulting from the Prototype Oil Shale Leasing Program is at least 7 to 10 years into the future and therefore we urge that the sale be held at the earliest possible date. It can be anticipated that additional leasing of Federal oil shale lands will probably await the results of these initial efforts; hence, the deferral of the sale under this Program will postpone the entrance of an oil shale industry into our energy supply picture further into the future, a delay which definitely will not be in the best interest of our Nation.

Very truly yours,



LETTER NO 65



November 1, 1972

Department of the Interior  
Mr. Rogers C. B. Morton  
Secretary of Interior  
Interior Building  
Washington, D. C. 20240

Action Office  
For info only

*Leid Stone Lm. 7000*

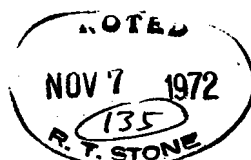
*MR*

Dear Mr. Morton:

Mesa Petroleum Co. is an independent oil and gas company whose primary operations consist of oil and gas exploration and production. Our gross revenues for 1971 were over \$88,000,000 with a net income of \$12.7 million.

In anticipation of the Prototype Oil Shale Leasing Program issued by the Department of Interior and our desire to enter into and compete for the oil shale leases to be submitted for bids next year, Mesa Petroleum Co. joined with six other independent oil and gas exploration companies and with Geokinetics Inc. to form United Shale Oil Company Joint Venture (USOCO). Our general plan is threefold:

1. To participate in the oil shale industry as a group since it would be prohibitive from a financial standpoint to participate as individual companies.
2. To have the independent portion of the industry represented in the bidding. It was generally felt that the Department of Interior would find that the independent portion of the oil industry has contributed greatly in the past to oil and gas discoveries and technology, and would therefore encourage the participation of such independent companies in the shale oil program.
3. To incorporate in our group the expertise of Geokinetics Inc. and of the other companies in the development of in-situ technology in the field of oil shale exploration.



Department of the Interior  
Mr. Rogers C. B. Morton  
Washington, D.C.  
November 1, 1971  
Page 2

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We were lead to believe through the earlier research of Mesa's participation in the program that the expertise, technology, and the unique approach by our group would be of sufficient interest to cause the Department of Interior to look favorably upon United Shale Oil Company at the time of granting the leases. From our examination of the leasing program, it appears that the above reasons for participating in the bidding for oil shale leases are no longer valid, in that the leases will be sold to the highest bidder with no concern for the developing of new technology for economical recovery of oil from oil shale. We have gathered a formidable group of independents; however, we believe that the financial and technical resources of the group should be applied to effecting a new technology rather than for acquiring the lease.

We feel very strongly that there is a need for the testing and development of in-situ technology. We have seen in the past the results of conventional mining and surface retorting methods, and feel this is the time and the place to research and test this new technology in the oil shale industry. The in-situ program, if successful, would provide a minimum of damage to the ecology and would permit the production of oil at a lower cost to the consumer. Most of the leases to be submitted for bid at this sale appear to be ideal for the in-situ method.

Due to the above and since the advantage to the public of a bonus type sale would be minimal compared to that of the development of an efficient recovery technology, we ask that you consider amending the Oil Shale Leasing Program procedures so that companies or groups of companies such as ours could have a valid opportunity to obtain an oil shale lease based on a prepared work program for developing new recovery technology and that minimum emphasis be placed on the cash bonus.

Respectfully submitted,

MESA PETROLEUM CO.



J. O. Upchurch, Vice President

LISKOW & LEWIS  
ATTORNEYS AT LAW

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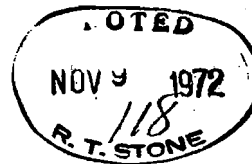
New Orleans, 70112  
November 6, 1972

NEW ORLEANS, LA 70112  
225 BARONNE STREET  
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TELEPHONE 581-7979

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321 TRAVIS ST.  
P. O. BOX 52008 O. C. S.  
TELEPHONE 232-7424

RICHARD E. GERARD  
GEO. C. SCHOENBERGER, JR.  
OF COUNSEL

Director  
Office of Hearings and Appeals  
4015 Wilson Boulevard  
Arlington, Virginia 22203



Re: Draft Environmental Statement for  
the Proposed Prototype Oil Shale  
Leasing Program - September, 1972

Dear Sir:

By letter dated November 3, 1972, the Offshore Operators Committee submitted comments and suggestions with respect to the captioned statement. As supporting evidence there was attached to these comments a letter from J. E. Wirsching, Chairman of the Engineering Subcommittee dated November 4th. Through inadvertence we attached a Xerox copy of Mr. Wirsching's letter rather than the original. That original is enclosed, and it is requested that it be attached to the original of the OCS letter.

We have also noted an error on page 10 of our letter comments. It relates to a quotation from page 85 of the OCS Statement. As presently written, the last two lines of the quotation are as follows:

"some of which serve offshore production  
and others serve OCS operations."

The quotation should read:

"some of which serve onshore production  
and others serve OCS operations."

Sincerely yours,

AWL/wf  
Enclosure

OFFICE OF  
NOV 8 1972  
HEARINGS & APPEALS

AUSTIN W. LEWIS, Attorney for  
Offshore Operators Committee



## LISKOW &amp; LEWIS

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 FRIEUR J. LEARY, JR.  
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NEW ORLEANS, LA 70112  
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New Orleans, 70112  
 November 3, 1972

RICHARD E. GERARD  
 GEO. C. SCHOENBERGER, JR.  
 OF COUNSEL

NOV 6 1972 (118)

Director  
 Office of Hearings and Appeals  
 4015 Wilson Boulevard  
 Arlington, Virginia 22203

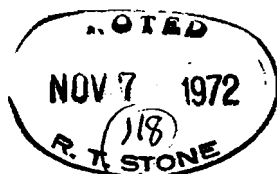
Re: Draft Environmental Statement for  
 the Proposed Prototype Oil Shale  
 Leasing Program - September, 1972

Dear Sir:

These comments are being submitted on behalf of the Offshore Operators Committee. That organization consists of 45 companies operating virtually all of the oil and gas leases in the Gulf of Mexico lying offshore and seaward of the coastlines of the States of Texas, Louisiana, Mississippi, Alabama and Florida, and extending to the limits of the Outer Continental Shelf. Its jurisdiction also includes the bays, inside waters and estuaries adjacent to or forming a part of the Gulf of Mexico within these states.

Our interest centers in that portion of the captioned Draft Environmental Statement, which will herein be referred to as the "Oil Shale Statement," found in Volume II dealing with Energy Alternatives. More particularly, we desire to comment on that portion of the study dealing with offshore production as an alternate energy source which commences on page 95 of Volume II and which comprises Section C.1.a.

We are concerned over several aspects of this discussion dealing with increased offshore production as an



November 3, 1972

PAGE 2

alternative energy source. We find some of the information given to be factually incorrect; in other areas, particularly those dealing with the environmental impact of the proposed alternative, we have noted a number of instances in which only the possible adverse environmental effects are considered, without any regard being given to other factors which minimize or eliminate these potential hazards. There are a sufficient number of these to cause the whole tone of the discussion to be negative in effect, causing the impression that increased offshore production could not be accomplished without substantial harm to the environment. We do not believe this to be the case at all. We recognize that all possible sources of environmental damage must and should be explored, but we believe that all factors which eliminate or minimize each such potential problem should also be discussed.

Our comments are both general and specific in nature. They are:

#### GENERAL

1. On October 14, 1972, the Bureau of Land Management released its Final Impact Statement on the proposed 1972 Outer Continental Shelf Oil and Gas General Lease Sale, Offshore Louisiana. This statement will be referred to herein as the "OCS Statement." This is a comprehensive effort which covers in detail every source of possible environmental concern that was considered in the Oil Shale Statement, except possibly one dealing with scenic views and vistas that may be more applicable to the Atlantic Coast.

It is our recommendation that the OCS Statement be incorporated by reference at the very beginning of the discussion of offshore production on page 95 of the Oil Shale Statement. This could be done by an opening paragraph which would acknowledge the full and complete discussion of the analysis made in the OCS Statement and that time and space would not permit such a detailed treatment in the Oil Shale Statement. It is further suggested that this be made even more specific by wording to the effect

November 3, 1972

PAGE 3

that wherever the OCS Statement has a more extended discussion on any environmental question than is found in the Oil Shale Statement, the latter will be considered as being supplemented and amplified by the OCS Statement.

Clear legal authority for the adoption of and the reference to the OCS Statement can be found in Natural Resources Defense Council v. Morton, 3 ERC 1558 (D.C.Cir. 1972), in which the court stated:

"In the last analysis, the requirement as to alternatives is subject to a construction of reasonableness, and we say this with full awareness that this approach necessarily has both strengths and weaknesses. Where the environmental aspects of alternatives are readily identifiable by the agency, it is reasonable to state them--for ready reference by those concerned with the consequences of the decision and its alternatives. As already noted, the agency may make references to studies already made by other agencies (including impact statements) or appearing in responsible journals." (3 ERC at 1564) (Emphasis added.)

2. It is believed that the opening paragraph on page 95 could be made more clear on the dual point of spelling out the projected recoveries from the oil shale project and emphasizing more strongly that the alternative offshore production would be over and above that already projected for the offshore areas. This could be accomplished by repeating the oil shale production figures and their time frames, this being 300,000 barrels per day by 1980 and 1 million barrels per day by 1985. This could be followed by a statement asserting that it should be emphasized that the additional offshore production under consideration is over and above those supplies that are currently projected to be produced from offshore sources during the same time frame; and here there could be referenced pages 6 and 7 of the OCS Statement.

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3. The second paragraph of the discussion on page 95 contains the major factual error mentioned above. It is said here that a drilling effort in excess of 6,000 wells might be required to provide supplies equal to those which could be provided through the oil shale program between 1976-1980. It must be remembered that in 1980, only 300,000 barrels per day are expected to be realized from oil shale sources.

Figures compiled from 1972 offshore production establish that wells in new fields, operating under current MER allowables, averaged approximately 400 barrels per day for oil wells and 6 million cubic feet per day for gas wells. Because much of OCS production is from gas wells, we must convert gas well figures to oil well figures on a BTU equivalent basis in order to make a valid comparison between future OCS production and oil shale production. Such a conversion, based on the fact that 6 MCF of gas has the BTU value of one barrel of oil, reveals that the average gas well produces the BTU equivalent of 2.5 average oil wells.

Based on these figures, and using 1970 and 1971 data from all U.S. offshore areas, which data includes gas wells drilled, oil wells drilled and dry holes drilled, we have determined that in order to establish production of the BTU equivalent of 300,000 barrels per day, the drilling of about 830 wells would be required. To reach the 1 million barrel per day level forecast for oil shale production in 1985, the drilling of 2800 wells would be required. To maintain a level of production at 1 million barrels per day, an additional 287 wells per year would have to be drilled.

There is annexed hereto as Exhibit 1 the written comments of Joe E. Wirsching, Chairman of the Engineering Subcommittee of the Offshore Operators Committee, verifying the figures used above and making comments on other phases of the offshore production discussion contained in the Oil Shale Statement.

POTENTIAL ENVIRONMENTAL IMPACTS

Comments will now be made on specific expressions of environmental concern that are incorporated in the Oil Shale Statement. These are:

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(a) AIR AND WATER (pages 97-99)

(1) Seismic and Drilling Operations  
(pages 97, 98)

The Oil Shale Statement correctly notes that exploratory seismic surveys leave little lasting impact. It is believed, however, that undue emphasis has been given in the Statement on the noise and air pollution caused by these operations.

An excellent discussion of modern seismic techniques is found on page 37 of the OCS Statement. Lengthy comments are found in a statement by Mr. E. O. Bell given at the August, 1972 hearing held in connection with the leasing of lands offshore Louisiana. The Bell statement is attached to this letter as Exhibit 2.

As to noise and emission of exhaust discharges, seismic operations and crew boats will cause less of either than the average sports fisherman's boat. As is shown by the Wirsching statement (Exhibit 1), the noise of a drilling rig is not noticeable over 1/4 mile from the rig.

This evidence completely refutes the suggestions of undue noise and air pollution found in the Oil Shale Statement and clearly demonstrates the minimal impact of such operations.

(2) Disposal of Trash (page 98)

Discharge of debris, bilge water and spills of crankcase oil are mentioned in the Oil Shale Statement as sources of environmental harm. Such discharges are

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absolutely forbidden by regulation. Heavy fines may be levied on all operators guilty of discharging these substances into the water. A complete discussion of all OCS regulations and methods of enforcement is found on pages 235-252 of the OCS Statement. The same Statement (pages 66, 67) finds that while a small amount of materials or debris may occasionally be spilled, the importance of debris is considered to be "relatively low."

(3) Blowouts (page 98)

The Oil Shale Statement classifies possible blowouts during drilling operations as the greatest potential for serious pollution. It recognizes that most blowouts occur in gas wells, but asserts that the liquids produced with the gas could cause a pollution problem. The history of blowouts does not bear out this conclusion.

The incidence of accidental blowouts in drilling operations is remarkably small and technology is operating to further reduce the possibility of such blowouts in the future. A 1972 USGS report notes that 4,946 wells were drilled on the Louisiana OCS from January 1967 through June 1971. In the course of these drilling operations, only 6 blowouts were experienced, all involving gas wells. This was a ratio of only 1.2 blowouts for each 1,000 wells drilled!<sup>1</sup>

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1. See Wirsching Statement, Exhibit 1.

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(b) STRUCTURES (pages 99, 100)

This section in general describes accurately the situation with respect to drilling equipment and production platforms. It is suggested, however, that for complete accuracy, corrections and clarifications should be made in the following areas:

(1) The opening sentences of this discussion relate to the construction of offshore drilling platforms and the temporary turbidity of the water caused by that construction operation. This inadvertently paints a picture of a lengthy construction operation at the offshore well site. This would not be correct. Offshore drilling platforms are constructed onshore. They are then towed to the offshore well site and are set on the sea floor, an operation which takes only a few hours. Any turbidity resulting from this setting lasts only a few minutes and could not possibly cause any appreciable damage to aquatic life. The same method of installation is used in connection with production platforms.<sup>2</sup>

(2) The second paragraph (page 99) discusses the disturbance of the scenic views and vistas of the coastal inhabitants and the open space qualities of the seascape. This discussion is preceded by the following sentence relating to Federal OCS leases:

"The geographic density of such units on Federal OCS areas vary considerably and generally most are three or more miles from shore so they are out of sight of land."

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2. See Wirsching Statement, Exhibit 1.

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It would be more accurate to delete this sentence and substitute one following the general expression of concern over the possible disturbance of the scenic views and vistas. That substitute paragraph could recognize that this concern does not apply to Federal OCS leases at all since the areas to be leased will all be more than three miles from the coast with the exception of the offshore Gulf waters of Texas and Florida, where they will be at least three leagues (approximately ten and one-half miles) from the beaches. The areas landward of these lines were ceded to the coastal states by the Submerged Lands Act of 1953.

- (3) A point of greater concern is found on page 100 where in discussing the beneficial effects of offshore platforms, there follows this sentence:

"These qualities can become tenuous if fish catches become tainted by petroleum and boats are stained by oil."

This suggests a permanent tainting of fish life and a frequent staining of boats by oil. Neither can be justified from the facts at hand. As is shown in a later comment in this same statement (pages 105, 106), any adverse effect on both shellfish and other forms of fish life usually is temporary in nature; and in connection with the massive offshore operations in Louisiana waters over a 25-year period, no evidence presently exists of permanent damage to fish life.<sup>3</sup>

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3. Reference OCS Statement, pages 137 to 142.



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It is suggested that the above quoted sentence could well be deleted in favor of the more general discussion which follows later in the Oil Shale Statement.

(c) TRANSPORTATION (pages 100, 101 and 108)

On page 101, it is stated that during the past 10 years, over 1/3 of a million barrels of oil have been spilled into the sea due to significant offshore accidents relating to oil and gas operations. This statement is made under the heading "Transportation" and it must be assumed that the large figure was given to show the quantity of pipeline or barge spills directly serving the offshore producing platforms. If so, it is believed that the figure is inaccurate.

On page 108 is found a statement that could be seriously misleading and could easily be construed as being contradictory to the findings of the OCS Statement. The comment relates to marsh destruction and is as follows (page 108):

"Recent studies (32) indicate that 16.5 square miles of marsh have been destroyed each year in coastal Louisiana by erosion, subsidence and construction. Most of this destruction is attributable to natural causes, including hurricanes, but some 12 percent to 15 percent is due to canalization accompanying oil and gas pipeline installation and oil rig access channels."

These figures are inadvertently misleading, since they clearly relate to marsh destruction caused by both onshore and offshore operations. The true picture is found on page 85 of the OCS Statement where it is said:

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". . . it has been estimated that, approximately 13% (or 2.15 square miles per year) of annual marsh destruction can be attributed directly to canal dredging operations associated with the oil industry.

"The majority of land loss falling within the category can be attributed to access canals dredged to site drilling rigs and is not directly related to offshore oil and gas development. No rig access canals will be cut as a result of OCS operations. Probably less than 3% of the 16.5 square miles annual loss can be attributed to the direct construction of pipeline canals; some of which serve offshore production and others serve OCS operations."  
(Emphasis added.)

(d) WASTE WATER (page 101)

In this discussion it is suggested that waste water is a production element which contributes to offshore pollution and that its effects upon flora and fauna are not yet fully understood. The Statement recognizes that OCS Order No. 8 requires the use of equipment that restricts the oil content of discharged waste water to 50 parts per million or less. The minute amount of oil discharged with waste water under this regulation can be dramatically demonstrated. It has been determined from calculations that 1 PPM is equivalent to 1 ounce of sand in 31 tons of sand.

The total impact of the waste water discharged under these stringent regulations was commented on at the OCS hearing by Dr. Lyle S. St. Amant, Assistant Director of the Louisiana Wild Life and Fisheries Commission, and a highly

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respected ecologist with more than 35 years' experience in Louisiana waters. He stated, "The general observation in Louisiana, however, would indicate that low levels of chronic pollution have not seriously affected productivity of the fisheries during the past 25 years." (See page 139 of the OCS Statement.)

Dr. Dale Straughan, testifying at the September, 1971 hearing on the Eastern Louisiana Lease Sale, firmly expressed the view that these small quantities of oil released in the open waters of the Gulf would not be harmful.

(e) BIOLOGICAL CONDITIONS (page 103)

In connection with the remark on page 103 of the Oil Shale Statement that, "Pollution created by dumping of trash, small oil leaks, etc. have a localized ecological impact," it must again be noted that such dumping is wholly forbidden by applicable OCS regulations and severe penalties attend such activities. Moreover, it should be noted that more than 25 years of offshore activity in the Gulf of Mexico has produced no discernible negative environmental impact.

Dr. Carl H. Oppenheimer, Director of the University of Texas Marine Science Institute, a renowned marine ecologist and author of over 70 scientific publications, commented on this question at the August, 1972 public hearing on leasing offshore Louisiana. These remarks, which are quoted on pages 142 and 143 of the OCS Statement, are as follows:

"What then is a scientist supposed to believe today. Not only is there no conclusive evidence of long-term adverse oil effects on the living populations, but also short-term effects are sketchy. Fish catch statistics and surveys show that commercial and sport fish and other biota are still in abundance.

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It must be emphasized that massive oil spills reaching the shore will cause physical damage to certain animals and possibly plants for short time periods. However, the reports on open water systems such as the Torrey Canyon and Santa Barbara spills and my own observations of the Louisiana beaches 7 months after the Shell Oil fire show that physical aspects are short lived. It can be pointed out that the present lease will add only 6 percent to the oil producing activity. It must be admitted that the demands for energy are much more important than the potential damage of the proposed offshore oil activities to be added through this lease hearing."

(f) COASTAL AREA AND LAND ENVIRONMENT  
(page 103, et seq.)

The Oil Shale Statement notes on page 104 that marine birds appear to be most vulnerable of the living resources to the effects of oil spillage. Although the Santa Barbara spill did result in a very substantial bird kill, it is submitted such incidents are extremely rare. Testimony offered at the public hearing in New Orleans, cited in the OCS Statement on page 478, correctly indicated the complete compatibility of oil operations and maintenance of bird habitats. Mr. Wayne Blankenship pointed out that more than 1,400 wells have been drilled within and near the vast wildlife and waterfowl refuges on and near Marsh Island in South Louisiana. Nine hundred of these have been productive and have yielded, over the past 15 years, over 3.4 trillion cubic feet of gas and over 288 million barrels of oil. During the period of these operations, the refuges have flourished. The complete compatibility of oil and gas operations with the maintenance of wildlife habitats is thus dramatically demonstrated.

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The comment concerning concentration of certain fish species due to congregation around platforms and its potential for disturbing natural predator-prey relationships is sufficiently ambiguous to make comment difficult. However, it is undeniable that the only reported impact noted by observers is the dramatic improvement in sports fishing. Artificial reefs are being sponsored in other areas in order to achieve the artificial reef habitat which the oil rigs provide in offshore Louisiana.

(g) OIL SPILL RECOVERY, CONTAINMENT AND DISPERSEMENT (page 105)

Oil spill recovery techniques have become substantially more sophisticated in recent years. All parties who deal with this problem are entirely familiar with the dangers of using emulsifiers and other chemicals to cope with this problem. Modern recovery techniques involve the use of oil barriers and surface skimmers to remove the hydrocarbons from the surface mechanically. A very thorough treatment of modern oil spill recovery techniques is found on pages 237 and 249 through 255 of the OCS Statement, and it is believed that it should be referenced in the Oil Shale Statement treatment of this issue.

The comment on page 105 of the Oil Shale Statement that, "There are no recovery devices capable of picking up oil on rough seas." is considered to be inaccurate. Modern devices are presently available which are capable of open-sea pickup in wave levels up to five feet. Also, it is a well-known fact that very rough seas are beneficial to the extent that they disperse the spilled oil and prevent the formation of a massive oil slick.

(h) SUMMARY (pages 107-109)

The first paragraph under the heading Summary suggests that although increased

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Federal inspection and regulation are helpful, they cannot guarantee that there will be no pollution from oil operations on the OCS. Certainly, these regulations cannot wholly prevent some discharges of oil into the sea, but it is the environmental effect of these discharges that is important. Dr. Lyle S. St. Amant, whose impressive credentials are noted above, pointedly stated his opinion on this question at the recent hearing. He stated:

"Because of these new enforcement and surveillance procedures with increased requirements for fail-safe operations and better engineering standards, I would suggest that the risk of accidents and of careless chronic pollution has been reduced to a point that OCS production is not a serious hazard to the environment."  
(OCS Statement at page 140) (Emphasis added.)

Substantial concern must be expressed over the closing statement of the section dealing with offshore production as an alternative to the oil shale program. That statement (page 109) is as follows:

"It is doubtful that a leasing program could be accelerated to an extent that production additional of one million bbls per day could result with a proper concern for efficient resource recovery and adequate protection of the marine environment within the 1972-85 time frame."

We believe that there simply is no evidence available to establish that the additional 1 million barrels per day could not be generated by 1985 from offshore production without appreciable harm to the marine environment. Also, there

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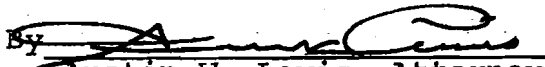
are many in industry and Government who feel that these additional recoveries should be generated to meet the growing energy crisis, this to be in addition to the acceleration of all substitute sources of energy such as the oil shale program. It is undeniable that all sources must be called upon to supply the needs. It has been estimated that energy requirements will rise by 93 percent by 1985, and that the demand for oil alone will rise by more than 100 percent. Outlook for Energy in the United States to 1985, Chase Manhattan Bank, June, 1972. Thus, the need for both shale oil and OCS production is clearly demonstrated.

We strongly believe that in order to meet this energy crisis, the oil shale program and similar projects should be fostered to the maximum extent possible, but that in reality, they are supplements, rather than replacements, to the maximum amount of production that can be realized from domestic offshore operations.

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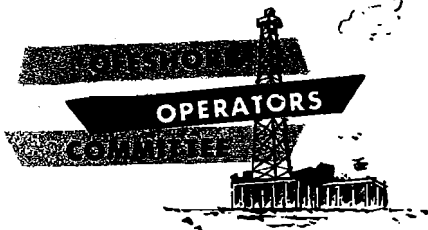
We appreciate very much this opportunity to express our views.

OFFSHORE OPERATORS COMMITTEE

By   
Austin W. Lewis, Attorney  
Suite 2211, 225 Baronne Street  
New Orleans, Louisiana 70112

AWL/wf  
Enclosures

cc: Mr. E. O. Bell, Chairman  
Offshore Operators Committee



66  
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1300 SARATOGA BUILDING  
NEW ORLEANS, LOUISIANA 70112

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November 4, 1972

Mr. E. O. Bell, Chairman  
Offshore Operators Committee  
1001 Howard Avenue  
New Orleans, Louisiana 70113

Dear Mr. Bell:

You have requested that the Engineering Subcommittee review the Draft Environmental Statement--Proposed Prototype Oil Shale Leasing Program, dated September 1972, with particular attention directed to Volume II of III, pages 95-109, Energy Alternatives. Members of our Subcommittee have reviewed the above for accuracy and for consistency with the Final Environmental Statement on the proposed 1972 Outer Continental Shelf Oil and Gas General Lease Sale, Offshore Louisiana, dated October 1972. Our comments follow:

Page 95. The Oil Shale Statement's figure of 6,000 wells required to provide supplies similar to those that could be provided through the shale oil program between 1976-80 is high. Based on 1970 OCS data, on an energy basis (BTU) only 830 oil or gas wells, including an allowance for dry holes, would be required to supply the additional 300,000 equivalent barrels projected for 1980 by the shale oil program. Approximately 2,800 wells would be needed to supply the 1,000,000 barrels daily forecast for 1985. To maintain the production level at 300,000 barrels daily, an additional 86 wells per year would need to be drilled. To maintain the 1,000,000 barrels daily production, an additional 287 wells would be required annually. Supporting data for these calculations are appended.

Page 96. Industry figures list 119 rotary rigs operating in domestic offshore waters in 1970 plus six rigs in operation offshore Alaska. The Oil Shale Statement has "less than 100...." In 1972 there have been 135 rigs operating in domestic waters and six in Alaskan waters.



Mr. E. O. Bell

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There is an inconsistency between the figures quoted in Paragraph 2 and the "Outer Continental Shelf Statistics" published by the U. S. Department of Interior Geological Survey--Conservation Division. This latter report shows that through 1971 there are 1,083 leases comprising 4,602,291 acres. Six hundred forty-nine of these leases covering 2,709,997 acres have been productive.

We question the ability to quantify the miles of pipeline required in the Gulf of Mexico.

Pages 98-99. The last two paragraphs discuss blowouts. The U.S.G.S. 1972 Lease Management Study of Safety and Pollution Control says from January 1967 through June 1971, for a 4 1/2 year period, there were 4,946 holes drilled in the Gulf of Mexico and there were six blowouts, for a ratio of 1.2 blowouts per 1,000 wells drilled. These were all gas blowouts. Current industry production statistics indicate an average of only 14 barrels of liquids are produced per one million cubic feet of gas rather than the 30 barrels/MMCF quoted in the Oil Shale Statement.

Page 99. Paragraph (b) Structures could cause a misunderstanding among the readers of the Oil Shale Statement as to the actual procedure of construction of offshore drilling and production platforms. Actually, there is very little platform "construction" done offshore. A tubular jacket or templet is fabricated onshore in one of the construction yards. It is then loaded onto a barge and towed to the drilling-production site. A 250-500 ton derrick barge lifts the templet from the barge and lowers it into place on the ocean floor in one piece. Piling is then inserted in the tubular templet legs and driven to a desired penetration by a steam hammer to adequately secure the templet.

The piling is cut off at the desired elevation above Mean Low water and a prefabricated superstructure is set onto the piling and the superstructure column legs are welded to the piling.

This is illustrated in the attached brochure from one of the principal offshore fabricators.

The only turbidity that might occur would be when the templet legs penetrate the ocean floor and when the legs are moved in the process of leveling the templet. Such turbidity is temporary in nature--lasting less than ten minutes-- and has no impact on aquatic life. What little turbidity may be generated during the installation of an offshore platform is insignificant compared to the turbidity caused by even the smallest trawl boat, and there are many trawl boats used in the Gulf of Mexico.

Mr. E. O. Bell

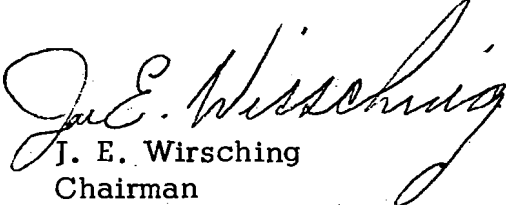
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Page 101 (second paragraph) and Page 104 (first paragraph) - Oil spills. There is an inconsistency between the Oil Shale Statement and the Final Environmental Statement (pages 129 (b) to page 135). We would recommend the language in the Final Environmental Statement. Also, the U.S.G.S. 1972 Lease Management Study of Safety and Pollution Control says there were 526 oil spills in the Gulf of Mexico in 1970 totaling 85,020 barrels. The Chevron and Shell platform fires accounted for 97% or 82,500 barrels of this. Drilling operations had 13 spills totaling 19 barrels of oil.

Page 107. We can find nothing in the literature documenting the statement in the first continuing paragraph that hundreds of thousands of swimming and diving birds have perished from oil pollution.

Yours truly,

  
J. E. Wirsching  
Chairman  
Engineering Subcommittee

/jm  
Enc.

# WELLS REQUIRED TO ACHIEVE PROJECTED SHALE OIL RATES

Year	Daily Producing Rate (1)	Number of Wells Required				
		Oil	Gas	Total Producing	Dry Holes	Total Wells
1976	50,000	70	22	92	47	139
1977	50,000	70	22	92	47	139
1978	150,000	208	67	275	142	417
1979	250,000	347	111	458	237	695
1980	300,000	417	133	550	284	834 *
1981	400,000	556	178	734	379	1,113
1982	550,000	764	245	1,009	521	1,530
1983	700,000	972	312	1,284	663	1,947
1984	850,000	1,181	378	1,559	805	2,364
1985	1,000,000	1,389	445	1,834	947	2,781 **

(1) Equivalent Barrels on an energy basis (BTU's).

Shale oil and Crude Oil Heating Value = 18,460 BTU/#.

Natural gas Heating Value = 1,000 BTU/cubic foot.

From A.P.I. 1970 Drilling Statistics:

531 Oil Wells - 50% of total wells.

170 Gas Wells - 16% of total wells.

362 Dry Holes - 34% of total wells.

Assumptions:

Oil Wells average 400 bbls. per day production.

Gas Wells average 6 MMCF per day.

6 MCF = 1 bbl. of oil - BTU equivalent basis.

∴ 1 Gas Well = 2.5 Oil Wells = 1000 bbls./day.

From drilling statistics 0.32 gas wells are drilled for every oil well drilled.

(No. of Oil Wells) x (400 bbls./day) + (No. of Gas Wells) x (1000 bbls./day) = Total Rate

(No. of Oil Wells) x (400 bbls./day) + 0.32 (No. of Oil Wells) x (1000 bbls./day) =

Total Rate

No. of Oil Wells = (Total Rate) ÷ 720.

No. of Gas Wells = (No. of Oil Wells) x 0.32.

Total Wells = (No. of Oil and Gas Wells) ÷ (1 - % Dry Holes)

\* To maintain this level of production and offset decline, an additional 86 wells/year will be required.

\*\* To maintain this level of production and offset decline, an additional 287 wells/year will be required.

LETTER NO 67

THE OIL SHALE CORPORATION

1600 BROADWAY  
DENVER, COLORADO 80202  
303/292-5140  
CABLE ADDRESS: "TOSCOPEYRO"



680 FIFTH AVENUE  
NEW YORK, NEW YORK 10019

November 6, 1972

James M. Day, Esq.  
Director of the Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Subject: Draft Environmental Statement -  
Prototype Oil Shale Leasing Program

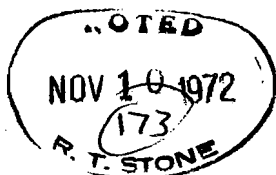
Dear Mr. Day:

Pursuant to notice given by the Department news release dated October 10, 1972, as subsequently modified by your comments at the Salt Lake City hearings on October 13, 1972, The Oil Shale Corporation is submitting herewith its comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program.

In addition, as a member of Colony Development Operation, The Oil Shale Corporation has approved the detailed written technical comments previously submitted by Colony and concurs in those comments as they pertain to the Draft Statement.

While our comments indicate that the Draft Statement may be improved in some respects, we want to take this opportunity to commend the Department on the preparation of a thorough, professional, and realistic analysis of possible oil shale development, consistent with both the letter and the spirit of NEPA. The comprehensive treatment given to a complex subject will be of lasting value.

Very truly yours,



*John A. Whitcombe*  
JOHN A. WHITCOMBE  
Senior Vice President

JAW/lb

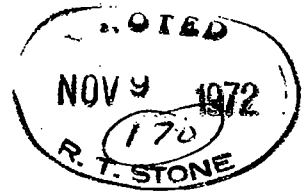
PHELPS DODGE CORPORATION

300 PARK AVENUE

NEW YORK, N. Y. 10022

WARREN E. FENZI  
EXECUTIVE VICE PRESIDENT

November 6, 1972.



Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

Enclosed please find a copy of a statement of Phelps Dodge Corporation to be included in the hearing record relating to the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program which was released on September 7, 1972.

Very truly yours,

*Warren E. Fenzi*

WEF:jo  
Enc.

STATEMENT OF PHELPS DODGE CORPORATION  
ON THE DRAFT ENVIRONMENTAL STATEMENT FOR THE  
PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

I. Introduction

Phelps Dodge Corporation, which is considering participating in a lease bid for Colorado Tract C-a, has reviewed the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program (the "Draft Statement") prepared by the Department of the Interior. Phelps Dodge Corporation believes, based on its studies and on the information contained in the Draft Statement, that oil shale is one of the more practical additional energy sources to develop to meet the energy crisis which the United States faces. As the Draft Statement points out, in the absence of the commercial development of alternative energy sources, our present petroleum, natural gas, coal and nuclear capabilities will probably not be adequate to meet increasing demands for electrical power, heat and other forms of energy.

The Draft Statement contains a detailed examination of the impacts of oil shale development on the environment and provides a basis on which to begin to design safeguards to prevent their occurrence. The more important

safeguards at this point are procedural in nature because any substantive requirements must of necessity remain tentative until more knowledge has been accumulated concerning the form of oil shale development and its precise impact on the environment. The extensive procedural safeguards provided by the Draft Statement, requiring departmental approval of detailed mining plans before mining operations begin, will be adequate to minimize environmental impacts by insuring that reasonable substantive standards are established at an early point.

Incorporation of environmental safeguards is a critical aspect of a successful oil shale leasing program, but it should be noted that it may be as long as 10 years from the date of the lease sale before full-scale commercial production in significant quantities is achieved. If we do not move now to explore oil shale's promise, pressures resulting from the growing energy crisis could cause more haphazard commercial production in the future.

With reference to Colorado Tract C-a, we would like to make several comments concerning the suitability of the tract for open-pit mining and the Environmental Stipulations incorporated by reference in the form of lease contained in Chapter V of Volume III of the Draft Statement. We should also like to discuss certain aspects

of the hypothetical mining plans discussed in Chapter III of Volume III of the Draft Statement.

## II. The Suitability of Tract C-a for Open-Pit Mining

Phelps Dodge Corporation has had extensive experience in open-pit mining since 1931, and operates large open-pit copper mines at Ajo, Morenci and Bisbee, Arizona, and Tyrone, New Mexico (opened in 1969). Many of the techniques used at these mines will be adaptable for use in open-pit development of oil shale, although further studies will be required before definitive mining plans can be prepared.

Based on its experience and the information presented in the Draft Statement, Phelps Dodge believes that the Department of the Interior is correct in concluding that Tract C-a is suitable for development through a combination of open-pit mining and surface retorting. The oil shale deposits contained in this tract are located near the surface and the overburden which must be removed is in a reasonable ratio to the oil shale which will be produced. Under such conditions, open-pit mining is a more efficient and proven means of extracting oil shale from the ground than either underground mining or in situ processing.

As the Draft Statement points out at page III-37



of Volume III, approximately 40 per cent of the oil shale would be left in an underground mine because pillars must be provided to support the mine roof. In an open-pit mining operation, all of the oil shale within the pit excavation would be extracted so that more efficient use of the area to be disturbed would be made. Thus, although an open-pit mining operation may disturb greater acreage within any one tract, the added production per acre disturbed may, in the long run, mean that fewer tracts will have to be operated at a given time.

The Draft Statement summarizes the tentative state of in situ oil shale technology at page I-33 of Volume I: "[In situ] technology is not yet developed to the extent that prediction of either technical or economic success is warranted." Because of the need to proceed with commercial production now, we believe open-pit mining should definitely be a part of the prototype oil shale leasing program.

### III. The Environmental Stipulations

Although we believe that it should be possible to conduct an open-pit mining operation on Tract C-a in compliance with almost all of the Environmental Stipulations, some of the Stipulations governing land rehabilitation and waste disposal are not compatible with

the most feasible open-pit mining technique available for the development of this tract.

A. Backfilling.

Section 11(A) of the Stipulations suggests that rehabilitation be carried out concurrently with mining operations and Section 11(J) anticipates that, unless the Mining Supervisor directs otherwise, within one year after completion of a particular operation, the lessee will "backfill, level, final grade, cover with topsoil and initiate revegetation" of the area covered by that operation. Immediate backfilling and leveling are practicable in connection with shallow strip mining, where a segment which has been mined may readily be filled with overburden and waste from the next segment to be mined, but because of the thickness of the overburden and the oil shale beds in Tract C-a, the overburden and spent shale will have to be deposited, at least for many years, away from the mining site. Although we have not conducted the extensive mining surveys which eventually will be necessary if the tract is to be developed, we feel constrained at this point to state that the cost of returning overburden and spent shale to the mining site from the areas where such materials will be deposited would render such action neither practicable nor desirable. To store such volumes of material temporarily,

and then move them back to the mined-out area, would also cause a longer period of disturbance to the surface than if the material were placed in permanent disposal areas initially. We do believe, however, that at some stage of the mining operation it might become economically feasible to deposit a portion of the overburden and spent shale directly in the mined-out areas of the pit, but at this time it is impossible to predict when such stage would be reached or whether to do so would have any environmental advantages.

We believe, therefore, that the Department of the Interior should consider the consequences of not back-filling the open-pit mine; in our judgment these consequences would not constitute unacceptable environmental impacts. The pit would not obstruct the view of the primary scenic resource in the area, the Cathedral Bluffs. If the level of the water table is sufficiently high, the entire floor of the pit might, as a natural consequence, be covered with water after operations ceased, perhaps to a depth which would create a usable artificial lake. Regardless of other developments, the pit would be left in a non-hazardous condition. Finally, we wish to emphasize that open-pit mining would not result in the kinds of environmental damage normally associated with strip mining.

B. Separating Overburden.

Section 11(K) of the Stipulations would require that overburden be separated into topsoil, subsoil and rock material, each of which is to be separately stockpiled. Such topsoil as exists in the mine and plant areas of the tract can be stockpiled and utilized in dressing disturbed areas for revegetation at an appropriate time. We see no need, however, to separate and stockpile subsoil and rock material; such a requirement would impose an unnecessary burden on oil shale development.

C. Revegetation.

Section 11(L) of the Stipulations providing for revegetation of "all portions of the leased lands which have been disturbed" should be modified to take into account that it may not be feasible to revegetate areas such as pit slopes that will be too steep to hold soil. We agree, however, that it may be feasible to revegetate most of the waste disposal area, the larger portion of the affected area resulting from an open-pit mining operation.

D. Waste Disposal.

Section 14(A) of the Stipulations describes the manner in which the lessee will be required to treat excavated material and spent shale. Although any lessee should

be required to take measures to assure stability of solid waste disposal areas and to prevent hazards, it will be impossible to predict, until further research and experimentation have been completed, whether compaction or some other method is most suitable.

E. Indefiniteness of the Requirements.

Primarily in Section 11(A) of the Stipulations but also in other sections, reference is made to complying with environmental requirements "to the extent practicable" or by taking all "necessary" or "appropriate" steps. These provisions appear intended to permit the Stipulations to be applied in a reasonable manner. Although we would expect to comply with all reasonable rehabilitation requirements and to take any other reasonable steps to protect the environment, we do not believe that we can enter into a firm legal commitment to take such action on the basis of standards that are not subject to objective determination. The use of such general provisions would make it impossible for a lessee to know the extent of its commitment until operations under the lease were practically completed, and even then a lessee and the Department of the Interior might disagree as to what would be "practicable" or "necessary"

Oil shale development will require the lessees to make enormous capital investments, apart from the costs of complying with environmental requirements, and there is no assurance at this time that the lessees will receive an adequate return. If the lessees must run the additional risk of being required to make substantial additional expenditures to comply with indefinite environmental requirements, even though they deem such requirements impracticable either on economic or technological grounds, it is unlikely they will choose to participate in the prototype oil shale leasing program.

Lessees will be required to submit detailed mining plans under 30 C.F.R. Part 231 and 43 C.F.R. Part 23 before any mining operations may commence and to file a detailed development program under Section 2(r)(2) of the Lease prior to the third anniversary of the date of the Lease. In these plans and programs, lessees will be required to state the manner in which they will reclaim the disturbed areas, including the extent to which they will backfill and revegetate, and the manner in which they will meet the other environmental criteria incorporated in the Lease. These plans and programs are subject to the approval of the Mining Supervisor, and once approved, they bind the lessees throughout the lease term.

We believe it is reasonable to require lessees to propose and accept environmental requirements after making the exhaustive studies that will be required in preparing these plans and programs. At such times, lessees will have a better understanding of the environmental problems and will be more certain of the commitments they might reasonably make. If the plans are not acceptable to the Mining Supervisor and cannot be revised to the mutual satisfaction of the parties, the lessee should be entitled to relinquish the Lease without penalty. Under these circumstances, the environment would not have been altered.

Since these plans and programs are to provide definitive expressions of the actions to be taken by lessees to protect the environment, the indefinite requirements contained in the Stipulations would appear to be inappropriate. Some of the Stipulations, such as Section 4 relating to fish and wildlife, do reflect the definitive role to be played by the mining plans and development programs. We would suggest that other Sections of the Stipulations be modified accordingly and that Section 4 of the Lease be modified to permit a lessee to relinquish the Lease as a matter of right

prior to the fourth anniversary of the date of the Lease, rather than prior to the third such anniversary, to provide time for modification of the environmental terms of the development program if they are not acceptable to the Mining Supervisor.

F. Summary.

We agree in principle that oil shale development must be subject to environmental requirements, but these requirements must be established with the realization that the topography will be altered by open-pit mining and that the justification lies in the critical need to develop alternative energy resources. To clarify our comments concerning the practicability and reasonableness of the proposed environmental requirements, we are including as an Addendum to this statement suggestions for revising certain provisions of the Lease and Stipulations.

IV. The Hypothetical Mining Plans  
for Colorado Tract C-a

The mining plans presented in Chapter III of Volume III are admittedly hypothetical and, as the Statement indicates on page III-10, "a development plan for a mineral property of the size being considered would require extensive, detailed engineering studies of the type



normally used for actual commercial mining." Although we have not yet completed such studies, we believe that, with regard to Tract C-a, certain of the general assumptions underlying the hypothetical plan may require further examination. These assumptions have a substantial effect on the amount of affected acreage, the time when any backfilling will become compatible with open-pit mining and the extent to which the pit may be filled after mining operations are completed.

A. Affected Acreage.

Table III-3 in Volume III of the Draft Statement contains an estimate that after 30 years a cumulative total of 6,300 acres of land (of which approximately 1,800 acres would be within Tract C-a) would be disturbed as a consequence of conducting an open-pit mining operation on Tract C-a without backfilling. This estimate and the others in the Table are based on the assumption that the oil shale to be mined within this tract contains an average of 30 gallons of shale oil per ton of oil shale. If the assay is less than 30 gallons per ton, a greater tonnage of oil shale will have to be processed to produce 100,000 barrels of shale oil per day and, in turn, a greater daily tonnage of spent shale and waste material will be produced and a larger disposal area may be required.

B. Backfilling.

At several points in the discussion of the hypothetical mining plans and elsewhere throughout the Draft Statement, reference is made to backfilling the mined-out pit after approximately 16 years as space becomes available. For instance, at page III-11 of Volume III, the Draft Statement reads: "After about 16 years, sufficient space would have been mined out in the pit to allow room for pit disposal of the overburden." We do not know the basis for this statement, but we believe that, in light of what is known about the thickness of the oil shale beds, the 16-year estimate is unrealistic.

In the lease tract nomination papers submitted on January 27, 1972 by Phelps Dodge Corporation and other companies, passing mention was made of the possibility of backfilling in connection with an open-pit operation. Until the actual development program required by Section 2(r) of the Lease has been prepared, however, it will be impossible to predict when any backfilling will become compatible with open-pit development of Tract C-a and to what extent the pit may be filled after mining operations are completed.

## V. Conclusion

Phelps Dodge Corporation supports the Proposed Prototype Oil Shale Leasing Program and urges its implementation with the revisions to the Lease and Stipulations suggested in the Addendum attached to this Statement.

ADDENDUM

Phelps Dodge Corporation believes that the revisions suggested below to the Lease and the Environmental Stipulations are consistent with the provisions of 30 C.F.R. Part 231 and 43 C.F.R. Part 23 and would make the terms of the Lease requiring protection of the environment more reasonable and effective in light of existing knowledge (underscored portions would be added; [bracketed] portions would be deleted):

1. Section 2(k)(2) of the Lease.

Revise the first sentence to read as follows:

"(2) To conduct all operations on the leased lands in accordance with approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and, in general, to conduct all such operations in the manner provided in such plans so as to prevent injury to life, health or property, to avoid, minimize, control, or repair damage to the environment, including land, water and air, to avoid, minimize, or correct hazards to the public health and safety, and to avoid wasting the mineral deposits which may be found in, upon or under such lands."

2. Section 4(a) of the Lease.

Revise the second sentence to read as follows:

"In no event shall the public interest be deemed to be impaired by a surrender or relinquishment of this lease prior to the [third] fourth anniversary date hereof."

3. Section 8(A) of the Stipulations.

Revise the first sentence to read as follows:

"The Lessee shall utilize and operate all facilities and devices [in such a way as to eliminate or minimize air pollution] with a view to eliminating or minimizing air pollution in accordance with approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and in accordance with the approved development program provided for in Section 2(r)(2)(i) of the Lease."

4. Section 8(B) of the Stipulations.

Revise to read as follows:

"The Lessee shall make every effort to minimize dust problems in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and in accordance with the approved development program provided for in Section 2(r)(2)(i) of the Lease. Where necessary, sprinkling, oiling, or other means of dust control shall be required on roads and trails. The Lessee shall conduct processing operations so as not to create [environmental or] health problems associated with dust."

5. Section 9(A) of the Stipulations.

Revise the first sentence to read as follows:

"The Lessee shall utilize and operate all facilities and devices [in such a way as to eliminate or minimize water pollution] with a view to eliminating or minimizing water pollution in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 23, and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and in accordance with the approved development program provided for in Section 2(r)(2)(i) of the Lease."

6. Section 9(C) of the Stipulations.

Insert the following after the word "shall" in the second line and prior to the semicolon:

"to the extent provided in and in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and the approved development program provided for in Section 2(r)(2)(1) of the Lease".

7. Section 11(A) of the Stipulations.

Revise to read as follows:

"(A) In General.

The Lessee shall [to the extent practicable,] to the extent provided in and in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and the approved development program provided for in Section 2(r)(2)(1) of the Lease, rehabilitate all affected lands to a usable and productive condition consistent with or equal to pre-existing land uses in the area and compatible with existing, adjacent undisturbed natural areas. Rehabilitation methods may include [, but are not limited to,] among others, the following: leveling, backfilling, covering the surface with topsoil, and revegetating the spoil banks and pit areas consistent with sound restoration methods. To the extent provided in such plans and program, the Lessee shall leave reclaimed land in a usable, non-hazardous condition such that soil erosion and water pollution are avoided or minimized [. The Lessee], shall [to the extent practicable,] conduct any such backfilling, leveling and grading concurrently with the mining operations [.] and, upon removal of property at termination of the Lease pursuant to Section [6] 7 of the Lease, [the Lessee] shall [, to the extent practicable,] complete the restoration of affected lands to a usable and productive condition consistent with or equal to pre-existing land uses in the area and compatible with existing adjacent undisturbed natural areas."

8. Section 11(B) of the Stipulations.

(a) Revise the first sentence to read as follows:

"The Lessee shall submit for approval by the Mining Supervisor an erosion control and surface rehabilitation plan as part of the exploration or mining plan submitted in accordance with the provisions of 43 C.F.R. §§ 23.7 and 23.8."

(b) Delete the second sentence.

(c) Add the following as a new last sentence:

"Compliance with such erosion control and surface rehabilitation plan shall be reported each year as contemplated by 43 C.F.R. 23.10."

9. Section 11(C) of the Stipulations.

Revise the first sentence to read as follows:

"The Lessee shall leave all disturbed areas in a stabilized condition in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231, and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and in accordance with the approved development program provided for in Section 2(r)(2)(1) of the Lease."

10. Section 11(J) of the Stipulations.

Revise to read as follows:

"The Lessee shall, [unless otherwise directed by the Mining Supervisor,] to the extent provided in and in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and the approved development program provided for in Section 2(r)(2)(1) of the Lease, backfill, level, final grade, cover with topsoil and initiate revegetation of each segment of the operation area [in accordance with the rehabilitation plan as soon as that segment is no longer

needed, but not later than one year after completion of the particular operation unless an alternative schedule has been approved by the Mining Supervisor]."

11. Section 11(K) of the Stipulations.

Revise to read as follows:

"The Lessee shall, unless otherwise directed by the Mining Supervisor, separate overburden material and stockpile it separately as to topsoil [,] and as to subsoil [,] and rock material for later use as fill and as top dressing for rehabilitation of disturbed areas."

12. Section 11(L) of the Stipulations.

(a) Revise the first sentence to read as follows:

"The Lessee shall, to the extent provided in and in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and the approved development program provided for in Section 2(r)(2)(1) of the Lease, revegetate all portions of the leased lands which have been disturbed by his operations [as soon as possible thereafter in order to minimize and, if possible, to prevent erosion and related problems]."

(b) Delete the second and third sentences.

13. Section 14(A) of the Stipulations.

Revise to read as follows:

"The Lessee shall, to the extent provided in and in accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231 and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and the approved development program provided for in Section 2(r)(2)(1) of the Lease, backfill or reclaim excavated material and spent shale [and shall compact it thoroughly by machinery to avoid or minimize erosion and toxic or other leaching which creates pollution problems]."



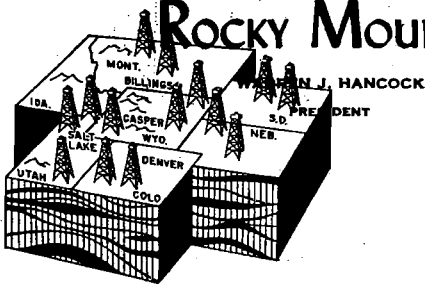
14. Section 14(B) of the Stipulations.

Revise the last sentence to read as follows:

"The Lessee shall remove or otherwise dispose of all waste in [a manner acceptable to the Mining Supervisor] accordance with the approved exploration or mining plans as provided in the regulations in 30 C.F.R. Part 231, and 43 C.F.R. Part 23, modified, where necessary, to cover other than surface operations, and in accordance with the approved development program provided for in Section 2(r)(2)(i) of the Lease, and in accordance with all applicable standards and guidelines of the State, the United States Public Health Service and the Environmental Protection Agency."

LETTER NO. 69

# Rocky Mountain Oil and Gas Association



BOX 1555  
BILLINGS, MONTANA 59103

OFFICE OF

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HEARINGS & APPEALS

October 20, 1972

The Honorable James M. Day  
Director, Office of Hearings and Appeals  
Department of the Interior  
Interior Building  
Washington, D.C. 20240

Dear Mr. Day:

Reference is made to the notice published in the Federal Register of September 7, 1972 at page 18098 relative to the "Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program" prepared by the Department of the Interior.

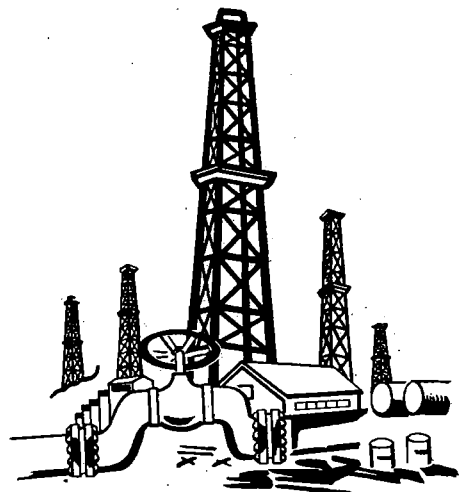
Attached is the statement of the Rocky Mountain Oil and Gas Association. You will note that this Association generally approves the draft environmental statement, and urges that it be adopted so that the vitally needed oil shale leasing program can go forward.

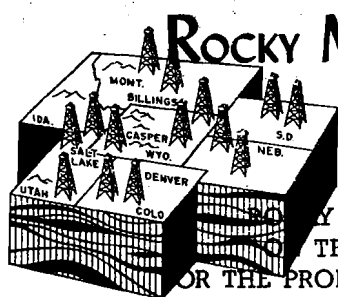
Respectfully submitted,

*Warren J. Hancock*

WARREN J. HANCOCK  
President

WJH:jmk





# ROCKY MOUNTAIN OIL AND GAS ASSOCIATION

October 20, 1972

## STATEMENT OF THE ROCKY MOUNTAIN OIL AND GAS ASSOCIATION ON THE DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

The Rocky Mountain Oil and Gas Association is an association of substantially all of those engaged in the exploration, discovery, development, production, transportation and refining of oil and gas in the eight-state area comprising Colorado, Idaho, Nebraska, South Dakota, Montana, North Dakota, Utah, and Wyoming. Its membership includes major and independent companies and individuals.

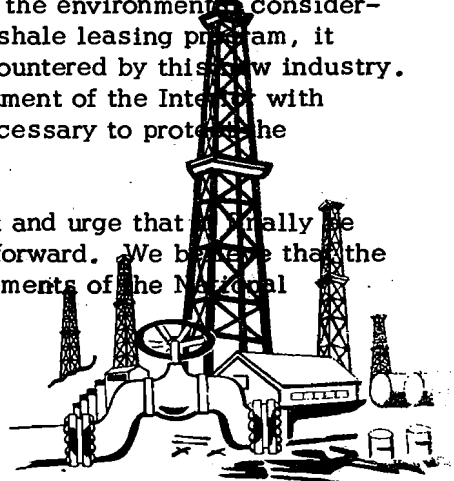
The Association is interested in synthetic fuels and has had an Oil Shale Committee since 1963. This committee was expanded in 1966 and since that time has been known as the Oil Shale and Synthetic Fuels Committee, which has concerned itself with all aspects of the development of synthetic fuels, including oil shale.

As an oil and gas association, we are concerned with maintaining adequate supplies of petroleum products for the American consumer, and we are especially concerned with the existing energy shortage which is expected to become more severe in future years. The increasing shortage of domestic petroleum supplies and the increasing reliance upon foreign sources imperils our national security and will adversely affect our balance of payments. We therefore believe that it is imperative that all potential sources of domestic energy supplies be promptly developed.

Among the foremost of these are the oil shale deposits of Colorado, Utah, and Wyoming. The Federal Government owns approximately 80% of the known oil shale reserves and we believe that the time has arrived for these lands to be made available for development by private industry as a partial solution to the energy crisis.

We have examined the draft environmental statement and proposed lease form, and believe that the Department of the Interior is to be commended for its fair and even-handed analysis of the environmental impact of the proposed leasing program. We believe that it is a knowledgeable and complete analysis of the environmental considerations of oil shale development. While it approved the oil shale leasing program, it candidly deals with the obvious problems which will be encountered by this new industry. At the same time, it suggests solutions and arms the Department of the Interior with abundant authority to prescribe and enforce all measures necessary to protect the environment.

We generally approve the draft environmental statement and urge that it be adopted so that this vitally needed leasing program can go forward. We believe that the draft environmental statement fully complies with the requirements of the National Environmental Policy Act.

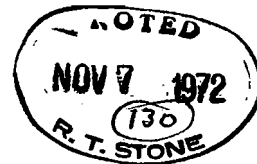




## SHELL OIL COMPANY

ONE SHELL PLAZA  
P.O. BOX 2463  
HOUSTON, TEXAS 77001

November 3, 1972



Mr. James M. Day, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

DRAFT ENVIRONMENTAL STATEMENT FOR THE PROPOSED  
PROTOTYPE OIL SHALE LEASING PROGRAM

In response to the announcement of September 7, 1972 on page 18098 of the Federal Register concerning the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program, we should like to submit the following comments, and would appreciate their being included in the official hearing records.

Shell Oil Favors Oil Shale Leasing

Shell Oil Company heartily endorses the program of the Secretary of Interior for stimulating the commercial development of oil shale by private industry. The U.S. oil shale deposits are becoming more important in view of the increasingly obvious and urgent need to develop domestic energy supplies. The proposed prototype oil shale leasing program is a logical first step in the development of this important domestic resource.

We believe that a national goal should be a reasonable level of U.S. energy self-sufficiency. To attain this goal, encouragement should be given to the development of such domestic energy resources as coal, oil shale and uranium. We regard western oil shale as potentially one of the principal domestic sources of energy and we should begin to develop it promptly. Estimates of the magnitude of the U.S. oil shale deposits vary; our own suggests that the Colorado deposit may contain as much as 70-80 billion barrels of potentially recoverable oil. This resource is nearly twice the estimated recoverable reserves of crude oil in the states. Development of these reserves should begin soon if the U.S. is to start to offset forecast dwindling supplies of domestic crude oil and natural gas by the end of this decade.

The Environmental Impact Statement includes an exhaustive analysis of the possible influence of the prototype lease sale on environmental conditions. We believe this treatment adequately covers the possible impacts of an emerging oil shale industry. In addition, straightforward mechanisms are provided for enforcing operating practices required for protection of the environment. We believe this planned oil shale development can be accomplished without undue sacrifice of environmental quality.

#### Delay of Oil Shale Development is Undesirable

The Environmental Impact Statement suggests (Vol. III, page I-3) that "Additional oil shale leasing would not be considered until development under the proposed program had been satisfactorily evaluated." Such evaluations are likely to require a number of years, and considering the impending serious constraints on energy supplies, we believe it is unwise to commit to such a rigid, predetermined, and long drawn out course of action. A delay of this magnitude does not appear to be necessary in order adequately to protect the environment. Moreover, domestic fuel requirements dictate that development of oil shale be as rapid as possible.

New technology for shale oil recovery may become available before the currently known processes have been completely evaluated on the leased sites. Such new technology could well require geological settings that are not represented in the tracts being offered in the proposed sale. Perhaps the Department of Interior should reconsider making R&D type leases available for demonstration of new technology. Such a lease should convert to a commercial lease if the demonstration is successful. Forced delay to wait the outcome of commercialization of known processes before offering sites on which new and different recovery methods could be demonstrated would be contrary to the government's tradition of fostering aggressive scientific research. Accordingly, we strongly recommend that this statement be deleted, and that no pre-set moratorium be imposed on future shale development.

#### Shale Oil Lease Stipulations Appear Workable

Many of the lease requirements and stipulations (Vol. III, Section V - A & B) will create additional expense, delays and difficulties. However, they do not appear insurmountable. From an operational standpoint we believe we could meet the lease performance requirements and environmental stipulations. The lease provisions make it abundantly clear that the environmental requirements and stipulations are open-ended and subject to change, and that operators may be faced with new, more restrictive, and costly requirements during the course of a lease. We consider this open-endedness to be inevitable, but we wish to point out that it does increase the risks for potential investors.

#### Energy Supply/Demand

In general, we agree with the overall total energy demand estimates that are included in Vol. II (page 12) of the Environmental Statement. How-

ever, we believe the natural gas supply (which is implied by the gas demand estimate) is significantly overstated so that the petroleum liquids demand is correspondingly understated. For 1985 the indicated natural gas supply is about 13 trillion cubic feet per year higher than our estimate, and about 17 trillion cubic feet per year higher than the National Petroleum Council supply estimate (U.S. Energy Outlook - 1971, Vol. 2, pages 81 and 141). We do not consider it realistic to assume that this quantity of natural gas will be available in 1985, especially in view of the gas prices currently permitted by the Federal Power Commission. Therefore, since oil is likely to replace any gas deficits, our lower gas supply estimate results in an oil demand (and level of oil imports) about seven million barrels per day higher than indicated in the statement (Vol. II, page 43).

### Oil Imports are not a Suitable Alternative

One of the alternatives to oil shale leasing proposed in the Environmental Statement is increased oil imports. Indeed, higher levels of oil imports are the most likely outcome if the proposed shale development program is not undertaken. It is Shell Oil Company's position that increased oil imports are not a desirable alternative to domestic oil shale development. Our reason for taking this position is that increased dependence on imported oil from foreign sources unnecessarily jeopardizes U.S. national security.

We recognize that in the near term, U.S. oil imports must grow to satisfy domestic energy demands. With that growth will come greater dependence on both imports of oil and the goodwill of the oil exporting nations.

Increasing oil imports will have an adverse effect on the balance of payments, and our ability to augment domestic supplies with imports may be limited by balance of payments problems. Production of one million barrels per day of shale oil in 1985 would be expected to reduce the cost of imports by more than one billion dollars per year. We have already witnessed a significant increase in the cost of foreign petroleum. These costs are anticipated to increase rapidly in the future, and aggressive development of our domestic energy resources may tend to act as a deterrent to price increases abroad. In addition to the increasing costs and balance of payments considerations inherent in reliance on overseas sources of energy, there are well founded doubts whether the oil resources of the free world will be adequate to meet the demand much beyond the mid 1980's.

The Environmental Statement sets forth explicitly the risks of interruption which have characterized imported crude oil supplies, and we believe those risks will increase. In the event that the basic petroleum supply becomes limiting, as mentioned above, the risk of interruptions will be greatly magnified.

Finally, over the next fifteen years liquid petroleum products will continue to be a primary fuel for U.S. needs, supplying over 45% of

Mr. James M. Day, Director

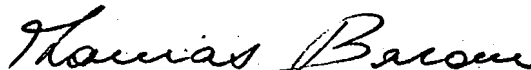
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the total energy requirements. Although coal and nuclear energy will, to some extent, displace oil in the utility market, petroleum will continue to supply about 30% of the combined industrial, utility and residential/commercial markets. However, transportation will, over the forecast period, continue to depend almost entirely on liquid petroleum. Consequently, any major future U.S. oil supply interruption would be felt at once in all sectors of the economy, but the effects could be particularly severe in the transportation sector.

For these reasons, we do not regard increasing oil imports as an acceptable alternative to development of domestic oil shale.

In summary, we support the Department of Interior oil shale program to foster the emergence of an oil shale industry. While some environmental changes are probably inevitable, careful planning and soundly formulated rules should reduce adverse impacts to an acceptable minimum. In view of the overwhelming need for domestic energy supplies, the development of this resource should be encouraged.

Very truly yours,

A handwritten signature in cursive script that reads "Thomas Baron".

Thomas Baron, President  
Shell Development Company

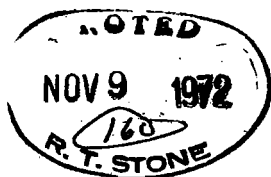
**SIGNAL  
OIL AND GAS  
COMPANY**

OFFICE OF

NOV 6 1972

HEARINGS & APPEALS

November 1, 1972



ENVIRONMENTAL STATEMENT -  
PROPOSED PROTOTYPE OIL SHALE  
LEASING PROGRAM

Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Attention: Mr. James M. Day, Director

Gentlemen:

Concerning the Proposed Prototype Oil Shale Leasing Program announced by the Secretary of the Interior on June 29, 1971, and the Environmental Statement prepared pursuant to Section 102 (2) (C) of the National Environmental Policy Act of 1969, Signal Oil and Gas Company submits the following comments regarding the draft Environmental Statement.

Based on our knowledge of energy supply and demand, and after careful consideration of the rationale, as set forth in the Environmental Statement, we agree with your postulation "that for some time to come the basic alternative to the production of a million barrels of shale oil would be a million barrels of imported petroleum". We further agree that the "government has the responsibility to encourage a favorable administrative and economic climate under which the Nation's petroleum industry can provide oil and gas supplies that are both secure and adequate, at the lowest practicable cost, and with minimal environmental impacts". We believe the Proposed Prototype Oil Shale Leasing Program is a significant step in exercising that responsibility and that it will effect the "balanced progress" that is so essential to oil shale development.

In order to insure the timely development of oil shale with minimum surface impact, Signal offers the following recommendations:

1. The awarding of leases should be based on the proposed development plans as well as the bonus bids, since this Program is designed to stimulate oil shale technology rather than to merely generate revenue. In particular, the inherent environmental advantages of an in situ process are recognized in the draft Environmental Statement although the dynamic experimental nature and yet to be defined operating costs

LETTER NO. 71

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one of The Signal Companies



are also pointed out. It would seem logical, considering the stated goal of the Program, to strongly favor an in situ development plan over surface processing.

In this regard, the efficiency of each proposed development plan should be scrutinized. A plan which provides for development of the entire oil shale interval must be favored over one that stipulates the development of only a thin rich section, i.e., the Mahogany Zone.

A comparison of room and pillar mining and in situ processing is appropriate. Using only data published in the draft Environmental Statement for deep rich oil shale, the following is revealed:

- A. Room and pillar mining operations require in excess of 40 percent more land surface than does in situ processing.
- B. Room and pillar mining operations consume in excess of 300 percent more fresh water than does in situ processing.
- C. Room and pillar mining operating expenses are more than 65 percent higher than for in situ processing. The capital investment requirements of the two processes are nearly the same.

From the above, one must conclude that:

- A. In situ processing is clearly superior to room and pillar mining with regard to environmental impact.
- B. The cost to the consumer of shale oil is significantly lower by in situ processing compared to room and pillar mining.

It is recognized that the above comparisons are based on somewhat hypothetical values due to the scarcity of data. A reliable comparison demands the initiation of a full scale in situ project in a thick, deep, rich shale oil section. Until such time as a company willing to pursue in situ processing is successful in acquiring a suitable lease, no further evaluation of this method is possible.

- 2. The awarding of leases should consider current oil shale lands ownership. It is likely that some of the companies competing for the Federal leases already hold leases on nearby comparable properties. Clearly, the control of oil shale lands should be spread among a maximum number of companies in order to optimize the stimulation of competitive development of oil shale technology. This concept is acknowledged in the draft Environmental Statement in considering the proper number of tracts to include under the Prototype Oil Shale Leasing Program.
- 3. The sequence proposed for the six lease sales should be revised. We suggest the order of sale be Tracts C-a, C-b, U-a, U-b, W-a, and W-b. The dominant criterion in selecting the proper order of sale should be

hydrocarbon content of the oil shale, i.e., the highest yield first. There can be little doubt that the interest generated in the Utah and Wyoming leases rests in large part on the destiny of the Colorado lands.

We are confident that the above comments will be given careful consideration in reaching the decision to proceed with the Prototype Oil Shale Leasing Program.

Thank you for the opportunity to review and comment on the draft Environmental Statement.

Yours very truly,

*W. H. Thompson, Jr.*

W. H. Thompson, Jr.  
President



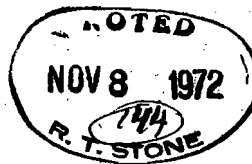
SOHIO PETROLEUM COMPANY

MIDLAND BUILDING, CLEVELAND, OHIO, 44115

November 6, 1972

H. PFORZHEIMER  
VICE PRESIDENT

Mr. Reid Stone, Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240



Dear Reid:

It is the purpose of this letter to comment upon the "Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program" issued by the U. S. Department of the Interior in September 1972. I believe the Department has done a remarkable job in compiling this three volume document. The Volume I assessment of the current state of oil shale technology is very well done. In addition, Volume I realistically describes the regional environmental impact of commercial oil shale development. Volume II examines the alternatives to oil shale production at the optimistically high rate of one million barrels per day by 1985. It seems more likely to me that this rate will not exceed 400,000 barrels per day by 1985. Volume III describes very well the selected tracts and the proposal to issue two prototype 5120 acre oil shale leases in each of the states of Colorado, Utah and Wyoming.

Although I conclude from review of the documents that the Department should proceed with this prototype leasing program, I wish to express concern on several points that can influence its success. These are:

1. The present law permits leases totaling not more than 5120 acres for each owner. This limitation will discourage some potential participants from bidding at the prototype lease sale for fear of being foreclosed from future sales when more will be known about how to commercialize shale oil. Moreover, the successful bidders at the proposed prototype lease sale will hesitate to make the major dollar commitments to commercially develop their leases with the existing technology. This is because they will be unable to lease additional tracts on which to utilize newer developments to minimize their maximum economic regrets. A policy which does not limit the holdings of an individual company to less than 10,240 acres per state and which excludes from this limitation any acreage under development is needed to encourage lease bidding and commercial production. If this change in the law cannot be accomplished prior to the prototype sale, it should be implemented retroactively as soon as possible thereafter.
2. The present depletion allowance is 15 percent of the value of crude shale oil vs. 22 percent for natural crude oil. Both allowances are limited to not more than 50 percent of taxable income. The depletion rate on shale oil should be increased to at least that of natural crude oil; and because shale oil economics will be at a marginal level, the 50 percent limitation should be removed from

Mr. Reid Stone

-2-

November 6, 1972

shale oil to make the depletion allowance effective in encouraging oil shale development.

3. Additional research and development in all aspects of oil shale technology is needed to provide a more acceptable basis for commercial expansion. Incentives to do this work should be provided in the prototype lease. This could be done through crediting funds expended by the lessee on oil shale research and development activities against rental and royalty payments otherwise due.

There are many competing and conflicting uses for public lands. All are important to various segments of our society. In contemplating the breadth and scope of these various uses, the "Draft Environmental Impact Statement" make it obvious to me that the relatively small proportion of these lands which are suitable for oil shale development should and must be used for this purpose. Only in this way can we help to alleviate the seriousness of this country's growing energy shortage.

Sincerely,



H. Pforzheimer

HP:w

cc: Director of the Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203



NORTH AMERICAN EXPLORATION AND PRODUCTION GROUP  
Fred M. Mayes  
Vice President, Development Projects

SUN OIL COMPANY P.O. BOX 2880, DALLAS, TEXAS 75221 (214) 744-4411

November 6, 1972

Re: Draft Environment Impact  
Statement  
Proposed Prototype  
Oil Shale Leasing Program

Mr. James M. Day  
Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Virginia 22203

Dear Mr. Day:

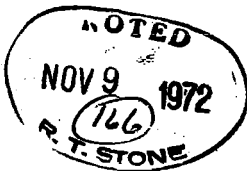
Enclosed is a copy of Sun Oil Company's supplemental comments on the Draft Environmental Impact Statement for the proposed prototype oil shale leasing program, and for ease of reference, a copy of Sun Oil Company's oral presentation.

The supplement to Sun Oil Company's statement includes references to specific pages and suggestions for change in language.

Sincerely,

Fred M. Mayes

FMM:dgl  
Enclosures



OFFICE OF

NOV 8 1972

HEARINGS & APPEALS

SUN OIL COMPANY  
NORTH AMERICAN EXPLORATION & PRODUCTION GROUP  
SUPPLEMENTAL COMMENTS  
ON  
DRAFT ENVIRONMENTAL IMPACT STATEMENT  
FOR PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

1. Volume II, pages 16-17, indicates that... "use of petroleum for electricity generation in 1970 was less than one million barrels per day, and projected use for this purpose in 1980 is some two million barrels per day." We believe the 1980 demand is understated. For example, the Chase Manhattan Bank, in their June, 1972 booklet entitled "Outlook for Energy in the United States to 1985" projects that oil demand by electric utilities will be some four million barrels per day by 1985. This estimate assumes increased consumption of coal and gas, and a huge increase in nuclear power for a total of some 12 million oil equivalent barrels per day of additional energy use for electricity generation. Shortfalls in the supplies of low sulfur coal and natural gas and continued delays in getting nuclear power generating plants on line will place an additional burden on oil. As an illustration, the potential shortage of 300 million tons per year of low sulfur fuel by 1975, recently estimated in a study commissioned by EPA, is equivalent to about two million barrels per day of oil. Eliminating all natural gas from electric utilities is equivalent to another two million barrels per day. Even if nuclear power comes on at a projected rate of more than eight million barrels of oil equivalent per day by 1985, from less than 0.5 million barrels per day concurrently, the demand for oil could conceivably increase to over eight million barrels per day by 1980-1985. The timing of shale oil production as proposed, and its low sulfur quality, make it an ideal supplement for this market.

2. Vol. II, page 41 states that "Complete adoption of all recovery methods where applicable to existing oil fields could physically recovery nearly 100 billion barrels of oil from these fields." In our estimation, this overstates the potential supply from this source. For example, Amoco Production Company estimates a total of 60 billion barrels of oil can be recovered profitably from presently discovered oil in place in the next two or three decades assuming that the non-inflation wellhead value of crude increases 20-30%.
3. Vol. II, page 49 states that "In its supplemental energy fuels, however, this Nation has within its borders the oil equivalent of several Middle East oil fields. Technology for economic production of this oil from our oil shale, coal, and tar sand resources must be developed if oil supplies from these sources are to be available to meet future fuel needs." We believe it is important to recognize the time frame within which production from these supplemental sources must be considered. A case in point is our own experience with the first commercial plant to recovery synthetic crude oil from the Athabasca tar sands. Research and development for this project began in 1960; field testing was initiated in 1963 and continued for two years, providing the data required for the design of the plant which we are now operating; we commenced operations at the plant in late 1967, but were not able to achieve design rates of production for several years. Twelve years of time, hundreds of thousands of man hours of engineering and scientific effort, and many millions

of dollars in investment have been required to bring this project to its present state. We seriously doubt that it would be possible to develop an economically feasible technology for the recovery of oil from oil shale on a commercial scale in any less time or with less effort or expense.

4. Vol. II, page 50 states that "Most recent studies indicate that each of the supplemental sources is nearly competitive economically with crude oil using processes currently known but not yet commercially proved." We disagree. Average wellhead price for crude oil in 1971 was about \$3.40 per barrel. In the publication "U. S. Energy - An Initial Appraisal, 1971-1985," the National Petroleum Council has estimated that profitable production of shale oil will be at least \$4 per barrel, even with an oil shale quality of 35 gallons per ton. Liquids from western strip coal are estimated to cost \$6-6.25 per barrel, once the process is developed and applied on a large scale. Cost estimates for domestic tar sands are not readily available, but are expected to exceed our own costs for Athabasca.
5. Vol. II, page 206 states that... "it seems reasonable to postulate that for some time to come the basic alternative to the production of a million barrels of shale oil would be a million barrels of imported petroleum." Significant government policy changes to provide for the stimulation of supplemental hydrocarbon energy supplies would be an alternative to additional imports.



6. Vol. III, page IV-4, indicates that "A minimum of 16 years of operation under the original lease is estimated to be required, however, before the backslope would be established and the pit opened to a size permitting backfill with overburden and thence processed shale." We agree in general that a number of years of operation will pass before backfilling can commence. However, many additional studies of the geology, hydrology, and potential mining concepts will be needed before a specific time for the start of backfilling can be identified.

STATEMENT OF  
R.E. FOSS, PRESIDENT  
NORTH AMERICAN EXPLORATION & PRODUCTION GROUP  
SUN OIL COMPANY  
AT HEARING ON  
DRAFT ENVIRONMENTAL STATEMENT  
FOR PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM  
U.S. DEPARTMENT OF THE INTERIOR  
DENVER, COLO., OCT. 10, 1972

Mr. Examiner:

I am R. E. Foss, president of Sun Oil Company's North American Exploration and Production Group.

I appreciate this opportunity to appear before you today to respond on behalf of my company to the Department of the Interior's request for comments on the "Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program."

The three-volume draft has been analyzed by Sun staff personnel who have been working on the oil shale study. This statement today gives briefly the views and position of Sun management based upon that analysis.

We request permission to file a more detailed statement, with references to pages and with suggestions for changes in language, before the record closes in order that the more detailed suggestions be included as a supplement to this statement.

First, we would like to acknowledge the impressive and extensive research that went into preparation and publication of the Draft. The people in Interior whose work and expertise went into compiling the impressive statement certainly are to be complimented.

Secondly, I can assure you that Sun Oil Company supports the premise that a prototype program affords the best hope for achieving the goal of providing for the United States

...(a) this new source of energy

(more)

- ... (b) in a time frame that is early enough to be of benefit
- ... (c) with a commercial technology which will permit the development by private enterprise
- ... (d) in a manner which will afford a minimum adverse impact on our environment

Sun Oil Company recognizes its environmental responsibilities and has no real quarrel with the pure environmental conclusions of this Draft Statement. However, we must point out our serious doubt that these volumes as a whole present the true economic perspective when they touch upon prices and rates of return and upon expenditures for investments and operating costs, which will include items for conservation and reasonable land restoration. For example, in Volume I under the caption "Environmental Impact," there is a discussion which includes statements that:

- (a) A minimum-sized commercial complex would produce 50,000 barrels a day or possibly as high as 100,000 barrels a day.
- (b) The capital investment required would be from 250 to 500 million dollars.
- (c) A rate of return of 10 to 13 per cent is anticipated.
- (d) Calculations are based on an assumed oil price of \$3.90 per barrel.

Not only must economic factors be considered, but also we must be realistic in our considerations. There must be a balancing of such considerations as the revenues from the oil, the grade of shale to be processed, and the extent of land restoration required. Sun has had a pretty thorough introduction into the problems of recovering oil from tar sands, and we believe that experience is useful here. On the basis of that experience, we have reached these conclusions:

- (a) A facility capable of recovering 50,000 barrels of oil per day from the shale would be a tremendous earth handling operation. Such an operation could be called "minimum" only in the sense

(more)

that nothing smaller would have much chance of being considered commercial.

- (b) A range of 250 to 500 million dollars is an extremely soft estimate. On the basis of track records, it is safe to say that such estimates of capital requirements usually prove to be on the low side.
- (c) As indicated in the Environmental Statement, a 10 to 13 per cent rate of return could be acceptable, but investors supplying the 250 to 500 million dollars of capital would need some assurance that such a rate is attainable after allowing for the unforeseen costs associated with developing a new process. It must be remembered that the investors in this prototype program cannot rely upon recoupment out of future plants or leases. The prototype investors have no assurance that they will ever get another oil shale tract.
- (d) No basis is suggested for the assumption of an oil price of \$3.90. It is not clear from the Environmental Statement whether this price is expressed in terms of today's dollars or future dollars. The oil that will be produced and sold from shale is many years down the road. We are not prepared to guess what the price of oil or the value of oil will be at that point in the future. It is our opinion that the prototype programs would not be commercial unless more revenues are generated for the programs than would be derived from the sale of oil at \$3.90 per barrel in terms of today's dollars.

We note that Volume II devotes considerable space to the relation of oil imports to the future of oil shale. There can be no question about their

(more)

interdependence. Furthermore, for the short term there seems to be no choice other than to utilize foreign oil to make up the deficiency between domestic demand and supply. The danger is in allowing our future dependence on foreign oil to reach unacceptable levels---certainly not the levels of over 40 per cent in 1985 as projected in Volume II. We simply must find the best way to make imports work for the solution of this Nation's energy crisis.

We were gratified to find in Volume III a recognition that the lease bonus itself constitutes an undesirable economic burden on development. While spreading of the bonus over several years will help, the fact remains that capital paid out for bonus still is capital not devoted to developing the prototype programs. I don't know what the Government might be required to do with this bonus money, but certainly a logical use would be to find a way to plow it back into the shale oil program.

In this connection, Interior's mention of possibly crediting extraordinary environmental costs against royalty for these prototype programs is a step in the right direction. Surely there are other powers which the Secretary has under existing law, or might obtain under future law, to insure the progress of these needed but very expensive oil shale prototype programs. We believe the welfare of the Nation requires it.

Thank you for the opportunity to express Sun Oil Company's views on this important matter. Having done so briefly, I request permission to file later the more detailed suggestions I mentioned earlier for inclusion in the record as a supplement to this statement.

**THE SUPERIOR OIL COMPANY**

P. O. BOX 1521  
HOUSTON, TEXAS 77001

November 2, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000 Interior Building  
Washington, D. C. 20240

Re: Prototype Oil Shale Leasing Program

Dear Mr. Stone:

The Department of the Interior should be commended for its mammoth effort to define, in the Draft Environmental Impact Statement, the current state of technology of oil shale processing; the need for oil shale development; and the potential problems which may arise from oil shale development.

It will not be possible to define or even accurately anticipate all of the problems which may arise from the development of oil shale until an oil shale complex is in motion. Only then can the exact complexion of the industry be observed and only then can all of the environmental problems be identified and solved. Fortunately, the Department of the Interior does not attempt in the Draft Statement to define all of the potential environmental problems which could arise, but it does quite extensively discuss the technology from which will form the basis for solutions when accurate definition of the problems is possible.

The Draft Environmental Impact Statement is addressed to the Prototype Leasing Program and in a formal sense is limited to the tracts nominated. In practical application, however, the final statement will establish guidelines and standards for any subsequent oil shale development proposals. The statement should, therefore, include some comprehensive treatment of the technology which is being developed which may eliminate the major objections by environmentalists to oil shale development. This specifically refers to development of oil shale which contains the minerals nahcolite and dawsonite.

Development of oil shale which contains the minerals nahcolite and dawsonite may be the only process which can economically pioneer commercial oil shale production as well as substantially upgrade the environment in the United States.

November 2, 1972

Unfortunately, the lease tracts selected do not contain commercial amounts of nahcolite, except for a small deposit in tract Cb. In order to insure the needed oil shale development under the best environmental and economic conditions possible, the leasing program must be supplemented to include development of oil shale which contains substantial amounts of nahcolite and dawsonite.

The enclosed paper is presented in order to outline a potential program which, if successfully pioneered, would increase many-fold the beneficial effect of oil shale development; would offer a solution to many non-oil-shale-related air and water pollution problems; and would eliminate most of the environmental objections to the development of oil shale.

Very truly yours,



B. E. Weichman

BEW/tb  
Enclosure

ENERGY AND ENVIRONMENTAL IMPACT  
FROM THE DEVELOPMENT OF OIL SHALE CONTAINING  
THE MINERALS NAHCOLITE AND DAWSONITE

Governmental agencies have defined the seriousness of the impending energy crisis. Figure 1 shows that the energy demand in the United States will rise from 70 to 125 quadrillion BTU's by 1985. The 1985 energy deficit, equal to 18 million barrels of oil per day, must be filled. The energy supply necessary to fill this deficit must satisfy four primary factors.

Figure 2 shows the four primary factors which are:

1. The supply must be domestic, at least to the extent that sufficient energy is unconditionally available for the defense and economic health of our nation.
2. The supply must be adequate, which is sufficient to supply the major portion of 70 quadrillion BTU's per year escalated at 4.2% per year compounded.
3. The supply must be environmentally usable, which means its use must not degrade the environment beyond the acceptable limits specified by law.
4. The supply must not be excessively expensive.

The only known energy reserves which are both domestic and adequate are coal and oil shale; however, the energy from coal does not at this time meet the third primary requisite of being clean, and oil shale does not at this time meet the fourth primary requisite of being economically available. Therefore, the solution to the energy crisis lies in the



technology which will deliver clean and economic energy from coal and oil shale.

Oil shale can be developed without degradation to the environment beyond the limits specified by law. In fact, it is the goal of Superior's oil shale program to define a process which will enhance rather than degrade the environment. The portion of the development program that is difficult to judge in terms of environment is the influx of people into the area. This effect can be minimized, however, by staffing the initial complex with west slope people. Studies show that the first 100,000 barrels of oil per day operation can be adequately staffed by a west slope workforce.

The following data define Superior's potential program for oil shale development which will, if successfully completed, provide an answer to the energy crisis and the availability of a long-term energy supply without degradation to the environment beyond limits specified by law.

The Superior plan is to develop oil shale which contains the minerals nahcolite and dawsonite. The development of these minerals, along with the oil shale in one integrated operation, will provide a clean utility fuel from shale oil as well as provide an absorbing agent which potentially will allow the burning of the vast coal reserves in the United States, and also make available, at a reasonable price, an additive which can be beneficial in waste water treatment.

The integrated process, as planned by Superior, can be, for simplicity, broken down into six steps, shown on Figure 3. These are:

1. Underground mining of the oil shale
2. Crushing and separation of nahcolite

3. Retorting and partial refining
4. Aluminum compound recovery
5. Underground spent shale disposal
6. Marketing of the products

#### STEP 1

The Superior mining program contemplates the underground mining of oil shale by the room-and-pillar method in zones which will average about 60 feet thick. In order to understand the problems involved in underground mining, a brief geological resume is necessary.

Figure 4 is a map of the northern Piceance Creek Basin. It shows the area which is underlain by oil shale that contains the minerals nahcolite and dawsonite. The stippled area shows the outcropping of the oil shale around the northern portion of the basin. This diagram shows that the oil shale which contains these minerals is almost entirely in the subsurface; that is to say, it does not outcrop around the edges of the basin. The only exception to this is a small area around the mouth of Piceance Creek and also a very limited exposure along the Cathedral Bluffs area in the northwestern part of the basin where dawsonite only is exposed in the oil shale. Dawsonite outcrops in various other oil shale beds around the basin, but only in insignificant amounts.

In order to mine oil shale which contains the minerals nahcolite and dawsonite, it is necessary to develop an access to underground mining operations either by shaft or by inclined adit from the outcrop. Figure 4 shows that the only area which lends itself to access by inclined adit from the outcrop is on the northeastern side of the basin around the mouth

of Piceance Creek.

Investigation of the geology shows that until more information is available to suggest otherwise, it is not feasible to gain access to the oil shale beds which contain nahcolite and dawsonite by shaft because of the presence of a tremendous aquifer called the "Leach Zone."

Figure 5 schematically shows a geologic cross section of the oil shale beds in the Piceance Creek Basin. The location of this cross section is shown on Figure 4. The oil shale beds occur in the Parachute Creek member which is divided into three zones.

The uppermost zone, in part the Mahogany Zone, is very thin at the northern outcrop and thickens to more than 600 feet in the southern part of the basin. All of the oil shale beds making the southern outcrops are in the Mahogany Zone. The Mahogany Zone does not contain significant amounts of the minerals nahcolite and dawsonite.

The lowest zone of the three shown on this cross section is called the "Lower Zone" and is developed mostly in the northern part of the basin. The Lower Zone contains the only known potentially commercial deposits of nahcolite and dawsonite.

Separating these two oil shale zones is the middle zone which is called the "Leach Zone." This zone is characterized by fractured high porosity oil shale, a large part of which is collapsed into rubble and debris. It has porosity, estimated at up to 30%, which is filled with saline water. In the northern area it is not feasible to sink a vertical shaft through this tremendous saline water zone without excessive cost. Therefore, the mine access must be from the outcrop by inclined passage

under the Leach Zone. This method of access affords the possibility of avoiding the porosity and high saline water of the Leach Zone in all of the operations.

The Superior program is presently planned to gain access to the mine area by inclined adit under the Leach Zone and the mining is to proceed in large 1,300 foot square blocks (Figure 5a). Each block would be enclosed by a rib pillar, except for an inlet and an outlet passage. This facilitates subsequent return of spent shale into the mine. Great care must be taken to prevent subsidence during the mining operations as a guard against induced fracturing upward into the Leach Zone which would allow excessive water to enter the mine. Underground mine development by blocks is insurance against Leach Zone water destroying all of the mining operations. If, during the advance of the mining operations, a porous zone is encountered which connects to the Leach Zone and it becomes impossible to contain or to control, then the block can be successfully retreated and closed so as to completely isolate the water influx from the rest of the mine.

It is necessary to understand that the oil shale which contains the minerals nahcolite and dawsonite is almost totally impermeable to water flow, with the exception of occasional fractures. It is anticipated that normal amounts of water will accumulate through occasional fractures during the mining operations. This water is programmed to be pumped to the surface where it will be totally consumed in the subsequent processing operations. The mine is programmed so as to guard against subsidence and undue water production.

## STEP 2

Separation of the nahcolite may be accomplished by selective crushing and screening. The plan calls for this crushing and screening to be in an underground room in a portion of the mine which can be adequately flushed with air and the air filtered so as to remove all particulates before being recycled or vented to the surface.

Three fractions are delivered to the surface from the mine. They are:

1. The oil shale which is delivered to the retorts for processing.
2. The nahcolite which is delivered to the surface for further processing or for shipment to market, and
3. The normal amounts of water made in the mine which are pumped to the surface for total consumption in the subsequent processing.

## STEP 3

Step number 3 involves pyrolysis of the oil shale containing dawsonite. The oil shale is heated in the retort and the oil vapors are collected and condensed into liquid shale oil. A certain fraction of the oil vapors are not condensable and they represent low BTU gas. This noncondensable low BTU gas is planned to be internally consumed in the total process as fuel. The condensed liquid fuel oil is collected for either further processing or for transport to market.

The retort is a closed system very similar to the first step in a refinery system and like a modern refinery is designed for safety and for environmental safeguards.

One possible retort system would be the TOSCO II process which is reportedly available for full-scale construction at this time. It is our understanding, without having access to the TOSCO proprietary information, that the TOSCO II retort will operate without degradation to the environment beyond the limits specified by law.

The retorting of oil shale can be conducted so as to produce shale oil that can be used directly as a clean utility fuel without further processing. The process for this retorting has been described by R. H. Smith from the ARCO Oil Company in a paper entitled "Manufacture of Low Sulfur Fuel Oil from Oil Shale" and this is printed in the Reprint No. 72, AIME-42. Of a potential 50,000 barrel of oil per day retort operation, 44,000 barrels can be marketed directly as low sulfur fuel. The remaining 6,000 barrels, which is the light fraction, would be treated for sulfur and nitrogen removal, and along with the noncondensable gases would be consumed in the plant as fuel. The sulfur can be stored and the ammonia from nitrogen removal can be marketed. Therefore, the only off-products from this step are plant fuel, utility fuel for shipment, ammonia and elemental sulfur.

A small amount of water will be made from the pyrolyzation of the oil shale and this water will be used to wet the shale prior to underground disposal. The water added to the shale prior to disposal is entirely contained within the shale and is locked into the shale just as interstitial water is locked into the rock. The water and the shale will be returned underground to their point of origin.

#### STEP 4

Step number 4 is the aluminum compound recovery from the pyrolyzed

oil shale. This actually begins in the Step 3 process where the retort pyrolyzes the dawsonite and converts it into a soluble aluminum compound that, for simplicity, can be called aluminum oxide. Figure 6 shows degradation of the dawsonite when heated in the retort. The sodium aluminum carbonate, which is dawsonite, degrades into aluminum oxide and sodium carbonate.

The pyrolyzed oil shale containing the altered dawsonite is delivered to a light caustic leach. The soluble aluminum compound is leached from the spent shale and is separated from the shale by conventional filtration. The shale is washed so as to remove all of the aluminum compound from the shale before being returned underground for disposal. The pregnant liquor containing the aluminum compound is subjected to carbonation and seeding which precipitates the aluminum compound from the liquor. The aluminum compound is filtered from the leach liquor by conventional filtration. The aluminum-free liquor is delivered to a soda ash plant where the liquor is evaporated for the recovery of soda ash. It is planned at this time to recover the water from the evaporators in barometric condensers. This water is pure water which is available for out-of-plant use or for recycle into the leach process.

#### STEP 5

In Step 5, the leached spent shale from the leach and wash tanks is dewatered and returned to the mine for disposal. It is planned that the leached spent shale will be returned to the mine by conveyor and placed in the mined out zones by a conveyor slinger which, in effect, compacts the shale into the open areas in the mine. As each block is filled, the block is sealed and closed from the operating portion of the mine.

Return of all the leached spent shale to the mine is possible because of the removal during processing of up to 50% of the original volume of the material. The swelling of the shale due to processing will increase the remaining volume from about 50% to about 90% of the original rock. The emplacement of the leached spent shale back underground eliminates any ecological problems encountered by surface disposal and it is expected to lend support to the mine structure.

#### STEP 6

Step 6 is the delivery to market of a large volume of products. A railhead located at the plant site will be necessary. An 80,000 ton per day oil shale and minerals plant would yield about 50,000 barrels of oil per day, 15,000 tons per day of nahcolite or nahcolite product, about 3,000 tons per day of aluminum trihydrate, and about 2,300 tons per day of soda ash. The railhead located approximately in the area of the mouth of Piceance Creek on the White River would connect to the railhead at Craig, Colorado. The route is being planned so as to minimize any interference with Colorado's migrating deer herd.

#### IMPACT

The availability of this integrated process can have a tremendous impact on the energy crisis as well as the well-being of American society. The focal point of the energy crisis is the lack of usable utility fuel. The major energy and environmental impact of oil shale and minerals development would be the resulting availability of domestic, adequate, clean utility fuel which can be consumed without degradation of the environment.

As discussed previously, oil shale is uniquely suited for production



of low sulfur fuel oil. The reference cited previously entitled "Manufacture of Low Sulfur Fuel Oil from Oil Shale" adequately defines the production process. Certain members of the Environmental Protection Agency have been briefed on the environmental precautions associated with the TOSCO II retorting process. It is anticipated that premium utility fuel can be produced from the oil shale retorting step without degradation of the environment.

The nahcolite product is tremendously important in the solution of the energy and ecological problems. Bench-level testing has shown that nahcolite or nahcolite altered by processing will absorb nearly 100% of the  $\text{SO}_2$  under controlled laboratory conditions, and follows generally according to the equation shown in Figure 7. Using powdered nahcolite with high surface area as the absorbing agent,  $\text{SO}_2$  in gas streams containing from less than 0.5% to more than 13.0%  $\text{SO}_2$  has been absorbed by nahcolite from the gas stream at nearly 100% efficiency. This efficiency has been maintained in laboratory tests at a greater than 90% level throughout the period of time necessary to consume or to convert nearly 100% of the nahcolite. This is to say that under controlled conditions, nahcolite will absorb almost all of the  $\text{SO}_2$  from a gas stream at greater than 90% efficiency until almost all of the nahcolite is consumed. The product from the absorption of  $\text{SO}_2$  by nahcolite is primarily sodium sulfate.

Laboratory tests, sponsored by Superior, have shown that nitrogen dioxide is absorbed moderately well by nahcolite compound and the efficiency of  $\text{NO}_2$  absorption is dependent upon the loading of the nahcolite compound and the temperature of the reaction. The reaction product is primarily

sodium nitrate. Additional testing is necessary to define accurately the complex chemistry involved in the absorption of nitrogen oxide by nahcolite. These tests are currently being conducted by Superior.

It is necessary to point out that the efficiency of nahcolite as a scrubbing agent is dependent upon the cost of  $\text{SO}_2$  removal. The theoretical limit of  $\text{SO}_2$  removal from an effluent gas stream by nahcolite is nearly 100%. The economic limit of  $\text{SO}_2$  removal by nahcolite has not yet been clearly defined; however, pilot testing conducted by Superior has shown that greater than 70% of the  $\text{SO}_2$  can be removed from the gas stream in a dry-solid-state reaction, and it is probable that greater than 90% of the  $\text{SO}_2$  can be removed economically.

More than 90% of the  $\text{SO}_2$  has been removed from an effluent gas stream in a pilot test which was conducted by Air Preheater Company, Inc., for the Department of Health, Education and Welfare. The contract number of this report is PH22-68-51. This testing compared the absorbing qualities of three agents. These were sodium bicarbonate, nahcolite and hydrated dolomitic lime. Very generally, the nahcolite was injected in powder form into the effluent gas stream and collected on a filter bag in a conventional filter house. The highest efficiency recorded during this testing was 96.2% with a stoichiometric ratio of 1.2. This is to say that during the term of this test, nahcolite absorbed 96.2% of the  $\text{SO}_2$  in the gas stream while using up 1.2 times the amount of nahcolite that would be theoretically needed by chemical equation. This report suggests that it is possible to use powdered nahcolite economically for  $\text{SO}_2$  removal from an effluent gas stream.

It is the opinion of Superior personnel that SO<sub>2</sub> and particulates can be economically removed to within the specifications set by law by the addition of powdered nahcolite into the effluent gas stream and the collection of the nahcolite compound and the particulates on a conventional bag filter in a conventional filter house.

Superior is currently constructing prototype plant equipment which will test the use of nahcolite as granules as well as in powder form for the removal of SO<sub>2</sub> from the gas stream. It is the goal of this testing program to prove the economic removal of SO<sub>2</sub> from an effluent gas stream with an efficiency greater than 90% while using up greater than 90% of the nahcolite absorbing agent.

Superior has also conducted pilot tests which have checked the efficiency of removing particulates from the effluent gas stream by the use of a granular filter made up of nahcolite. The object of this testing was to see if a granular filter of nahcolite could economically remove SO<sub>2</sub> as well as remove the particulates entrained in the gas stream. The monitoring in the pilot operation was inadequate to define economic removal of particulates; however, data from the pilot testing indicated that 84% of the particulates that would pass through the electrostatic precipitator could be removed from the effluent gas stream by the nahcolite filter. Combination of the electrostatic precipitator and the nahcolite filter could theoretically remove 99+% of the particulates entrained in the gas stream.

The economic removal of sulfur oxides, nitrogen oxides and particulates, to the extent specified by law, will be defined by the successful completion

of the Superior program, which is now in motion and is planned to be completed mid-1973.

If the Superior program is successfully completed, this process will allow eastern coal, regardless of its character, to be used for utility fuel without violating the emissions standards defined by law. The capital and operating costs are anticipated to be less than the cost of other clean fuel providing the nahcolite can be supplied as a by-product of the oil shale processing. Nahcolite can be produced more cheaply as a by-product from oil shale production than from direct nahcolite production operations. One ton of nahcolite will free for use 6.3 tons of 3% sulfur coal at stoichiometric proportions. Fifteen thousand tons per day of nahcolite, the amount potentially made available by the 80,000 ton per day oil shale operation described herein, will free for use about 94,500 tons per day of 3% sulfur coal at stoichiometric proportions.

Figure 8 shows that a combination of 50,000 barrels per day of 0.3% sulfur shale oil and 15,000 tons per day of nahcolite will potentially free for use one quadrillion BTU's per year. This is the equivalent of over 175 million barrels of oil per year. Figure 9 shows that an oil shale and associated minerals industry producing one million barrels of oil per day and 300,000 tons of nahcolite per day would make available 20 quadrillion BTU's per year of domestic energy. This is 54% of the projected 1985 imports of petroleum as projected by the National Petroleum Council, and is more than 16% of the 1985 projected total energy demand. An oil shale and minerals industry producing 1,800,000 barrels of oil per day and 552,000 tons of nahcolite per day would make it possible to supply,

from domestic resources, the total 1985 energy deficit. At this rate of production, there is over 200 years of supply in place in the Lower Zone of the Parachute Creek member.

#### ALUMINUM COMPOUNDS

Superior's original plan was to calcine the aluminum trihydrate recovered from the leach process into metallurgical-grade alumina, thereby providing a domestic source of aluminum for the United States. Recent testing has shown, however, that the recovery and production of a different aluminum compound may be in the best interest of the country.

Figure 10 shows that 8 parts of aluminum trihydrate can be reacted in a basic medium with 3 parts sodium sulfate to form 6 parts sodium aluminate and 1 part aluminum sulfate. Aluminum sulfate and sodium aluminate can be used to obtain special results in the double coagulation of highly colored waste waters. The combination of the basic sodium aluminate and acidic aluminum sulfate tends to neutralize and buffer the waste water. These compounds are also very effective in removing phosphorus from waste waters. John J. Convery, in a presentation to the Federal Water Quality Control Administration in San Francisco on October 28 and 29, 1970, reported as much as 95% removal of phosphorus from waste water using sodium aluminate in solution. Alum individually also has been used effectively in phosphorus removal by a number of municipalities, one most recently reported to be Sandusky, Ohio. The combination of these two compounds potentially forms an ideal additive for treatment of waste waters.

Pilot testing is necessary and is planned to be undertaken by Superior to prove the economic production of the ideal additive at a cost that can

be afforded by most municipalities. Irving Nielson, in a presentation to the American Institute of Chemical Engineers in February 1972, reports the cost of sodium aluminate at about \$175 per ton. This obviously is quite expensive as a waste water additive; however, the combination of sodium aluminate and aluminum sulfate produced from the oil shale integrated process should be available at less than half that amount. If Superior's planned program is successful, the actual cost will be defined.

A plant processing oil shale, nahcolite and dawsonite is potentially a source of pure water. This can be shown in a review of the processing operation. A one million barrel of oil per day oil shale plant producing nahcolite and dawsonite would use about 480,000 acre feet of water per year without exacting any surface water from the Colorado River system. Saline water from the "Leach Zone" can supply all of these requirements. Of the 480,000 acre feet of water per year, about 88,000 acre feet per year is consumed for dust control and spent shale wetting prior to disposal. Three hundred and fifty-five thousand acre feet per year is used for the leaching process in the production of aluminum compounds and sodium carbonate. However, almost all of this water can be recovered in barometric condensers as pure water for subsequent use. Thirty-eight thousand acre feet per year is required for the hydrogen production, if partial refining is necessary, and also for people facilities associated with the one million barrel of oil per day plant. This water can be supplied from pure water production from the leach processing, leaving a surplus of 317,000 acre feet per year of pure water. If the total water requirement of 480,000 acre feet per year is taken from the "Leach Zone", it is estimated that there

is at least a five-year supply of saline water in the "Leach Zone" in the Piceance Creek Basin, not considering recharge. The pure water produced from the process is equivalent to about three-quarters of the average flow of the White River as measured at Meeker, Colorado.

#### OIL SHALE DEVELOPMENT PROBLEMS

The development of oil shale and the associated minerals is affected by two additional factors. They are (1) the availability for development of land containing oil shale and associated minerals, and (2) the threat of damage to the oil shale section before and during development by the proposed Rio Blanco nuclear gas stimulation program.

#### LAND EXCHANGE

The first factor, the availability of land, could be corrected by a leasing program of the oil shale lands containing nahcolite. At this time, however, the physical access to oil shale containing nahcolite is blocked by the "Leach Zone" from vertical shaft entry. The distance away from the outcrop of the nahcolite deposit makes adit entry from the outcrop economically impractical. Recalling the geology previously discussed, it appears that access to the oil shale which contains nahcolite is restricted to an inclined adit below the tremendous aquifer called the "Leach Zone." An examination of the geography on Figure 12 shows that the only area which lends itself to economic access to the oil shale containing nahcolite is the area covered by the Superior property. Outside that area, the edge of the nahcolite becomes too far away from the outcrop to be economically reached by adit. This can be corrected by an exchange of land between the Government and The Superior Oil Company.

In order to bring about the economic development of these lands, The Superior Oil Company has suggested an exchange, considering all values on an equal value basis, of a sufficient amount of acreage to reshape the Superior land from a long linear configuration into a rectangular block. This would permit economic access to the nahcolite through the outcrop by other companies under a Government leasing program and it would also permit Superior to pursue the economic development by pioneering the mining under the "Leach Zone."

#### PROJECT RIO BLANCO

The second factor affecting oil shale and nahcolite development is the proposed Rio Blanco nuclear stimulation program. Simultaneous development of oil shale containing nahcolite and the Rio Blanco nuclear gas stimulation project is not possible.

It is not effective to argue empirical data pertaining to whether the nuclear explosions will or will not damage the oil shale. It is, however, logical to be fearful of damage when many 60-foot open span ceilings and walls of an underground mine complex, located under the tremendous saline water "Leach Zone", would be subjected to multiple 100-kiloton nuclear explosions in the adjacent areas. This fear is sufficient to deter the investment of the hundreds of millions of dollars necessary to adequately develop oil shale as long as there is any possibility of irreparable damage and loss of investment.

A comparison of the BTU energy reserve between Rio Blanco nuclear gas and oil shale containing nahcolite should be considered.



The Rio Blanco nuclear program proposes the recovery of 17 billion cubic feet of gas per well (640-acre spacing). This represents about 175 trillion BTU's per square mile.

Oil shale (600 feet thick and 25 gallons per ton) containing 15% nahcolite represents a value, from shale oil and coal that can be made available for use by nahcolite, of about 25 quadrillion BTU's per square mile. This shows that the development of oil shale and nahcolite could potentially yield, assuming a 50% recovery factor, seven hundred and fifty times more BTU's per square mile than the Rio Blanco nuclear project.

It seems inconceivable, under these conditions, that the Rio Blanco nuclear project could be allowed to proceed at the expense of oil shale development. It is also apparent that oil shale containing the minerals nahcolite and dawsonite must proceed at once in order to relieve the oncoming energy and environmental crisis.

# U. S. ENERGY CONSUMPTION & PRODUCTION

Compiled from NPC Data

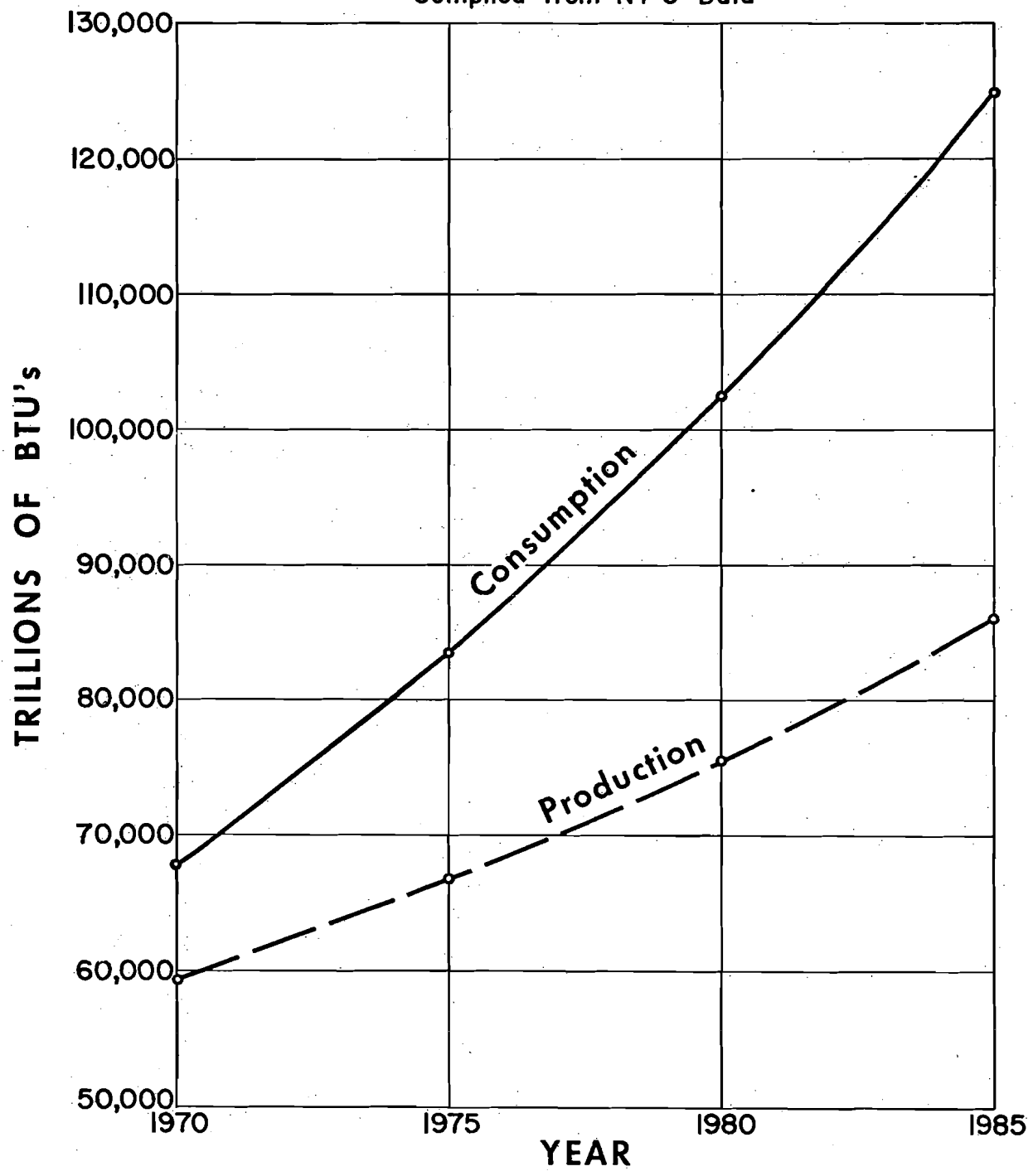


FIGURE 1

# **PRIMARY FACTORS TO BE NEGOTIATED IN THE MEDIAN TERM ENERGY CRISIS**

- 1. Domestic Basic Energy Supply**
- 2. Adequate Supply**
- 3. Environmentally Useable Supply**
- 4. Not Excessively Expensive**

**FIGURE 2**

## FLOW DIAGRAM OF OIL SHALE AND ASSOCIATED MINERALS PROCESS

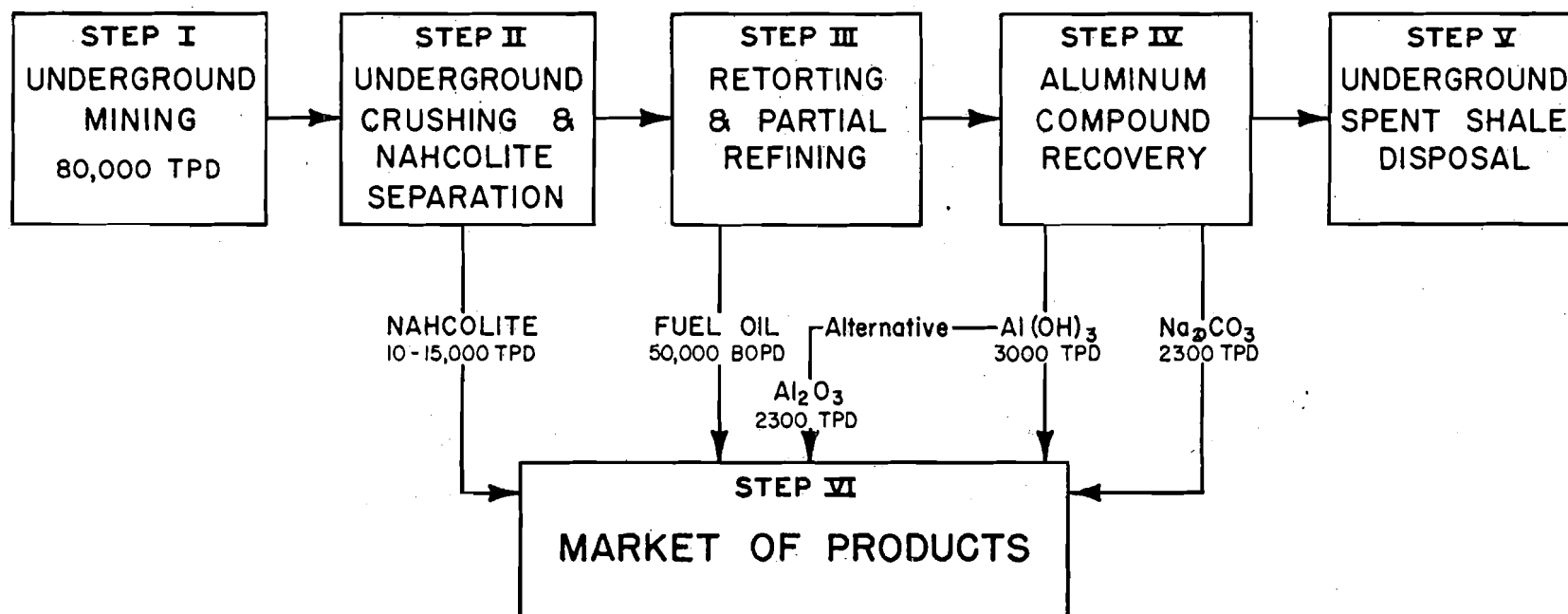
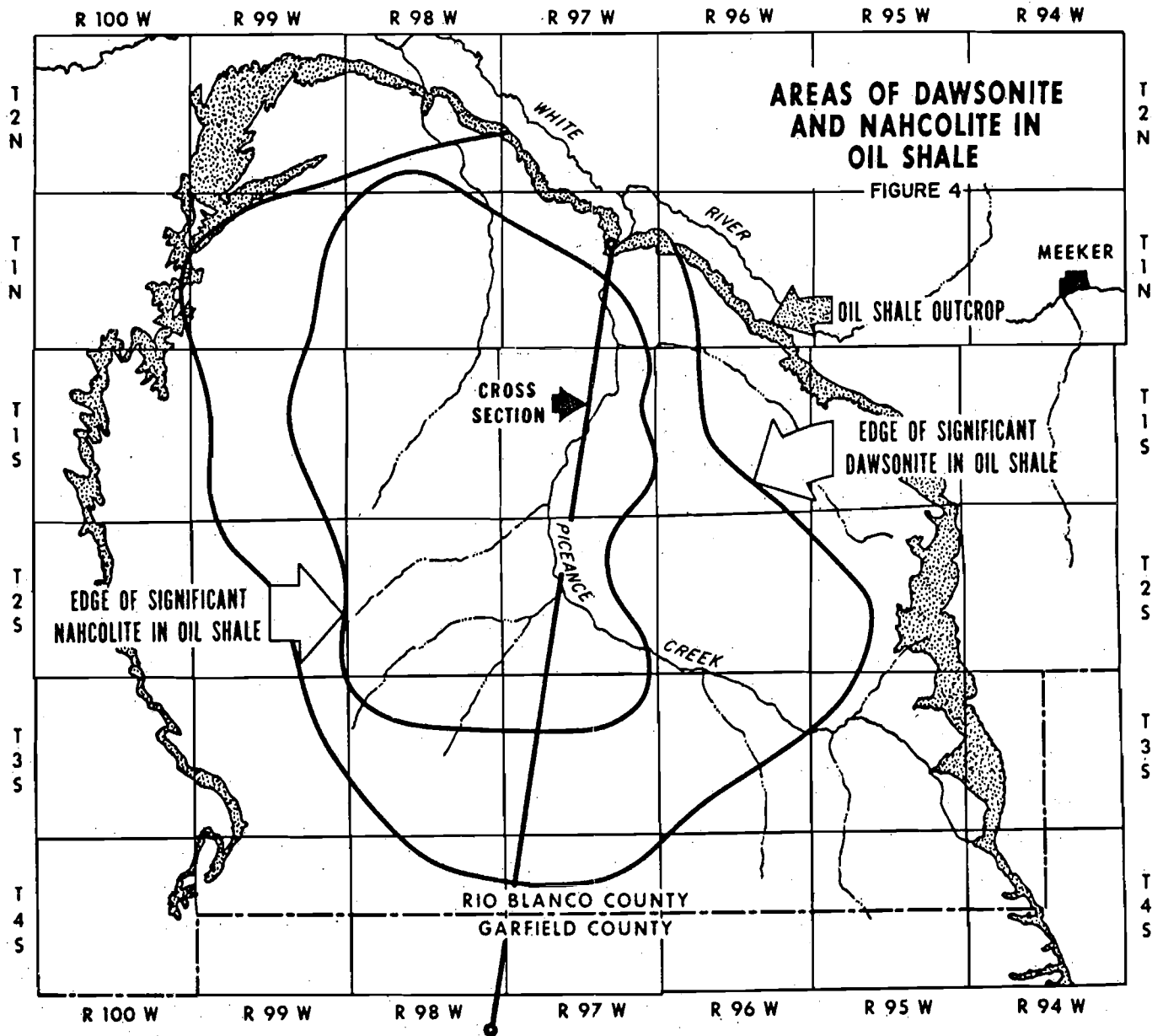
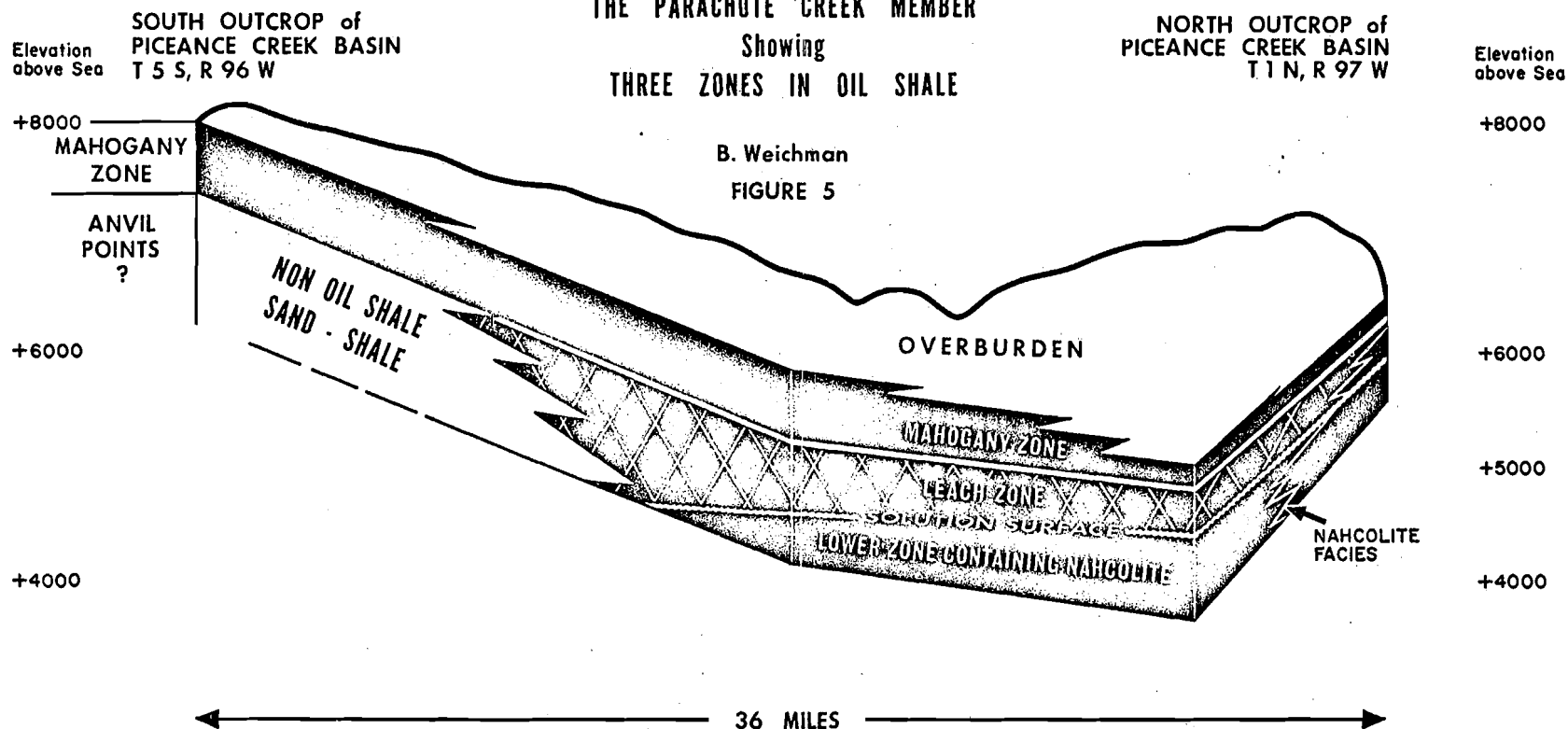


FIGURE 3

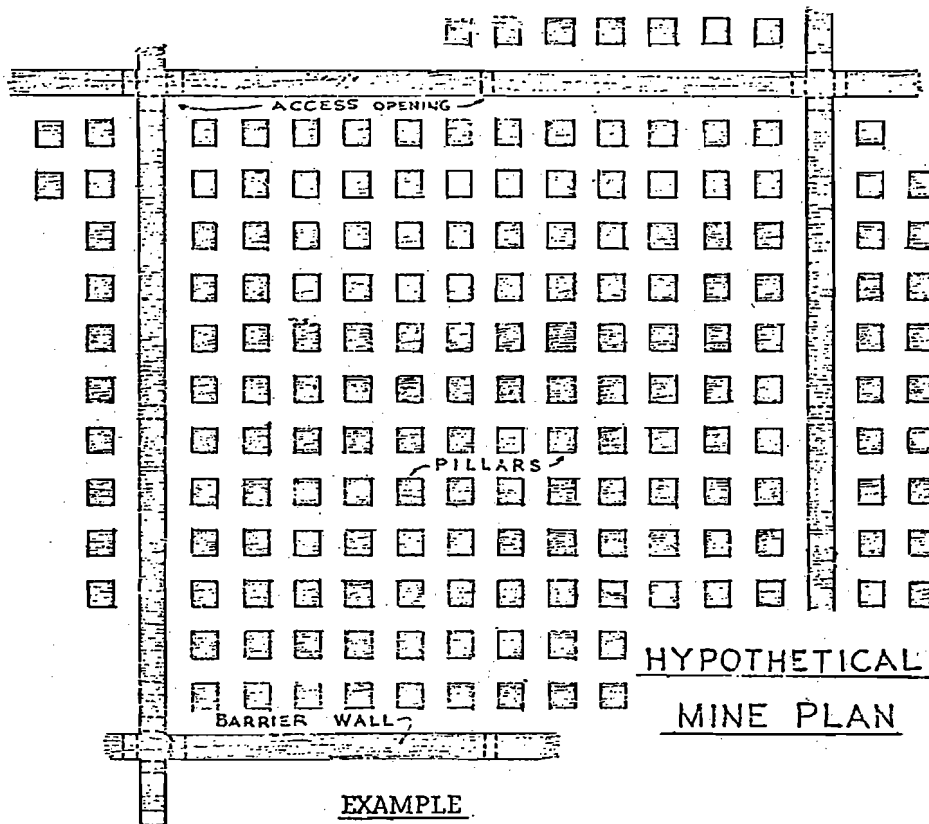


SCHEMATIC CROSS SECTION  
OF  
THE PARACHUTE CREEK MEMBER  
Showing  
THREE ZONES IN OIL SHALE

B. Weichman  
FIGURE 5



OIL SHALE MINING ESTIMATED ORE RECOVERY



ASSUMPTIONS

- 60 foot thickness of material
- Panels contain 144 pillars
- Containing wall same thickness as pillars
- Fifteen cubic feet material = one ton

Recovery From Panel - 60 Foot Span, 60 Foot Pillars

$$\begin{aligned}
 &1560' \text{ center to center of barrier wall} \\
 &1560' \times 1560' \times 60' \div 15 &= 9,734,400 \text{ Tons} \\
 &\text{Less pillars } 144 \times 60^3 \div 15 &= 2,073,600 \text{ Tons} \\
 &\text{Less wall } 2 \times 30' \times 1560' \times 60' \div 15 + \\
 &\quad 2 \times 30' \times 1500' \times 60' \div 15 &= 734,000 \text{ Tons}
 \end{aligned}$$

$$\text{Recovery} = 6,926,800 \text{ Tons}$$

$$\text{Percent Recovery} = \frac{6,926,800 \text{ Tons}}{9,734,400 \text{ Tons}} = 71.15\%$$

FIGURE 5a

# DECOMPOSITION OF DAWSONITE BY PYROLYSIS

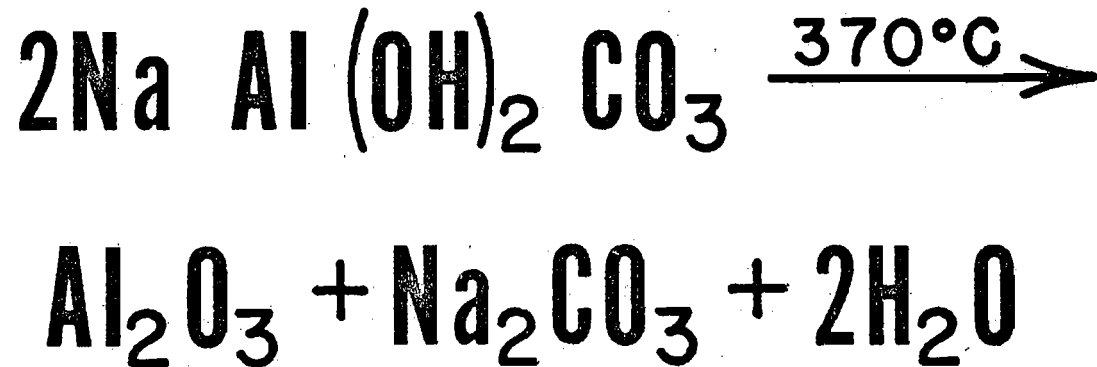


FIGURE 6



# SOLID STATE ABSORPTION OF SO<sub>2</sub> by NAHCOLITE

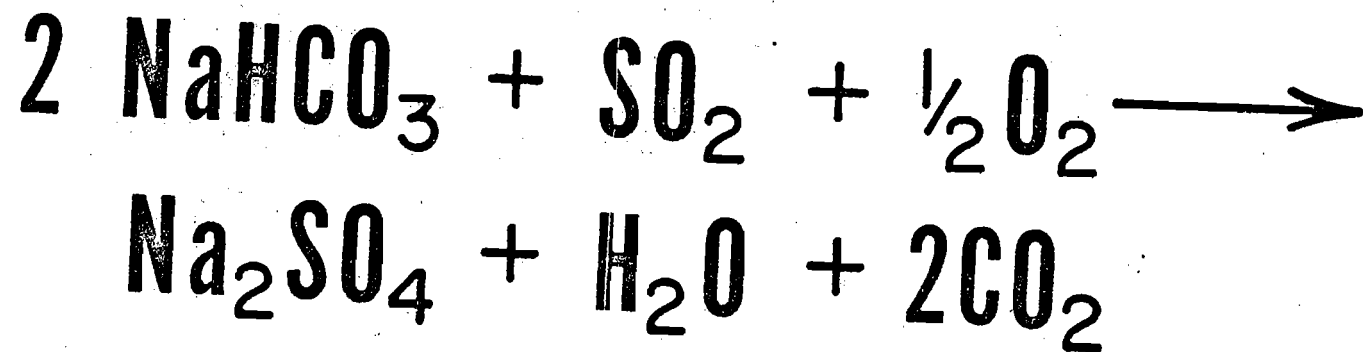


FIGURE 7

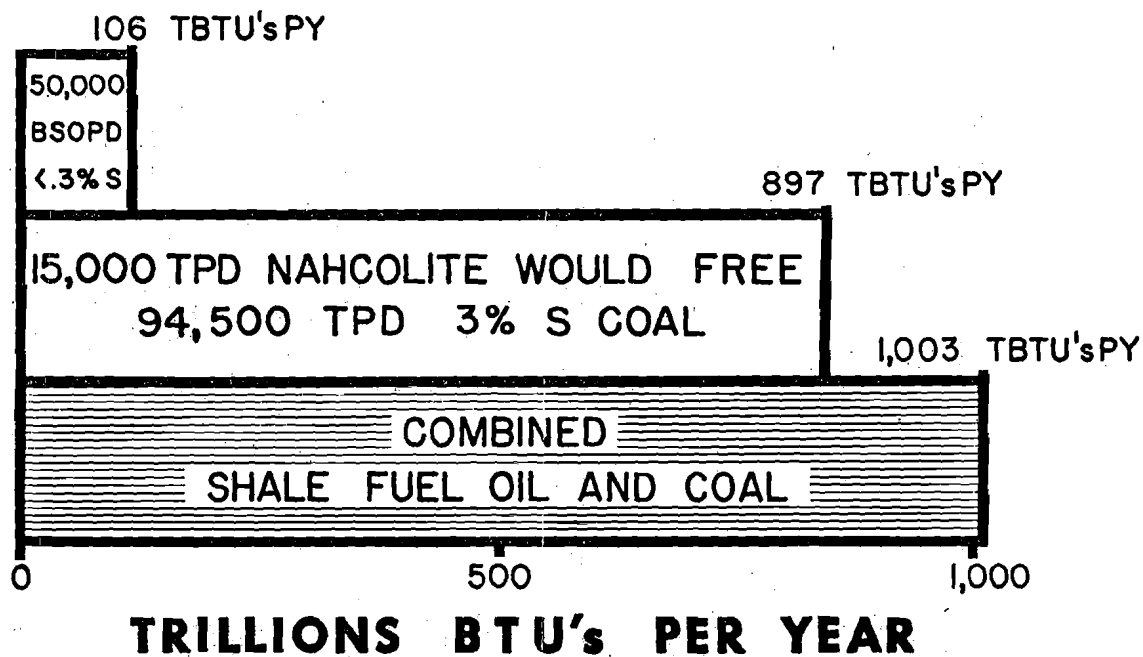
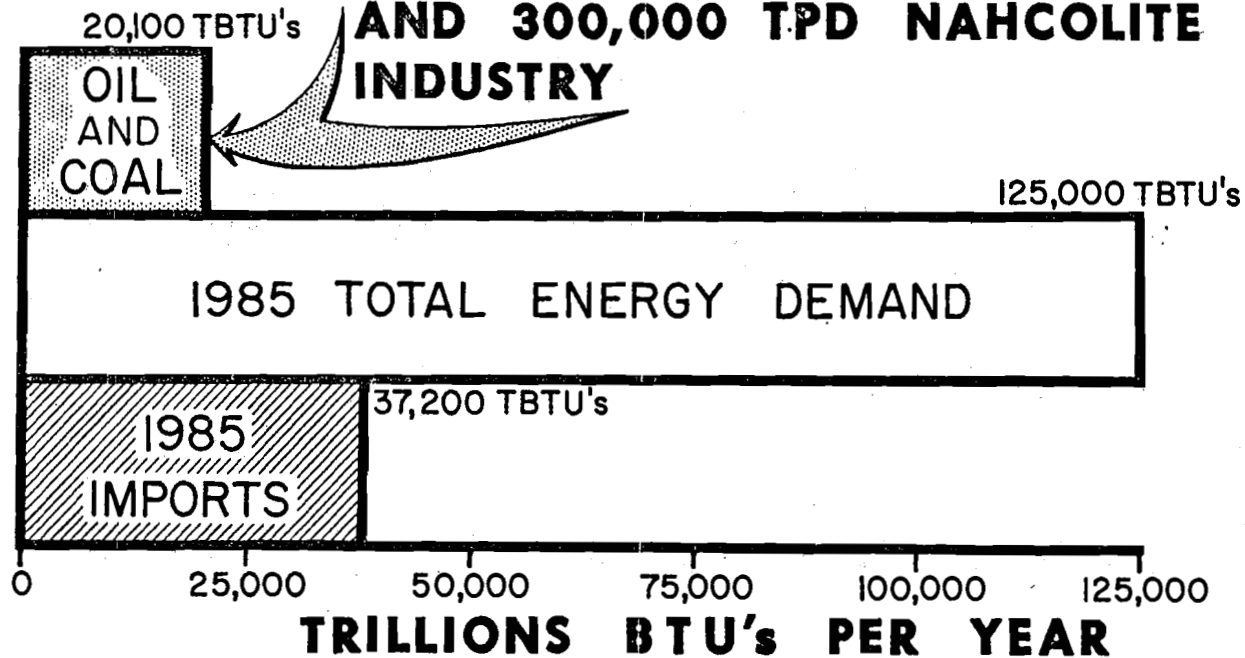


FIGURE 8

**\* ENERGY POTENTIAL RESULTING  
FROM 1MM BOPD OIL SHALE  
AND 300,000 TPD NAHCOLITE  
INDUSTRY**



**\* ONE TON OF NAHCOLITE FREES FOR  
USE 6.3 TONS OF 3% SULFUR COAL**

**FIGURE 9**

**SODIUM ALUMINATE AND ALUMINUM SULFATE  
PRODUCED FROM  
ALUMINUM TRIHYDRATE AND SODIUM SULFATE**



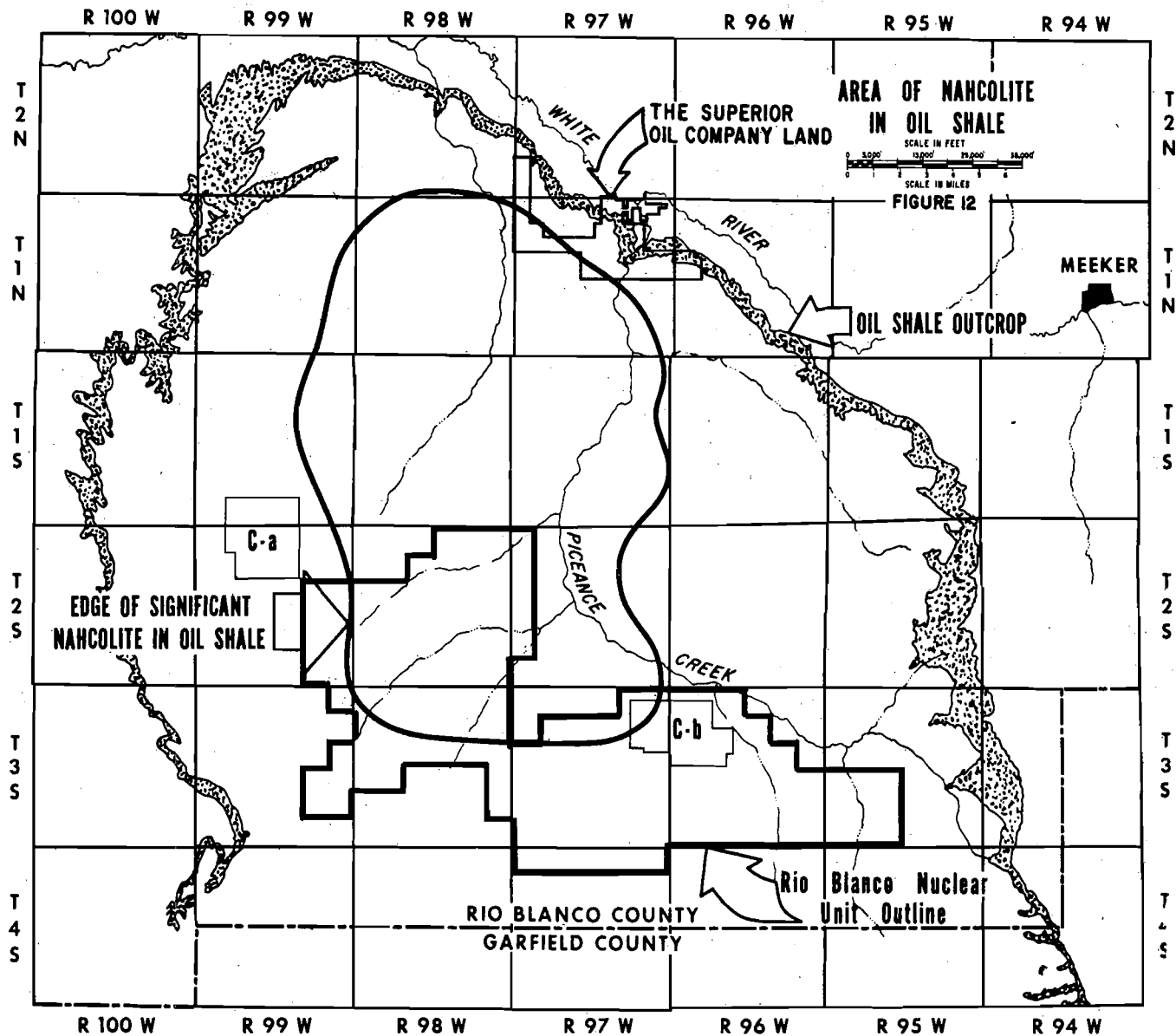
**FIGURE 10**

# OIL SHALE DEVELOPMENT TIMETABLE

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985 AND BEYOND
<b>MINING</b>													<b>1.6 MM TPD PRODUCTION</b>
<b>6,000 BOPD RETORT</b>						<b>CONSTRUCTION AND OPERATION</b>				<b>PRODUCTION</b>			
<b>44,000 BOPD RETORT ADDITIONAL</b>									<b>CONSTRUCTION</b>		<b>PRODUCTION</b>		<b>1 MM</b>
<b>50,000 BOPD RETORT ADDITIONAL</b>											<b>CONSTRUCTION</b>		<b>BOPD</b>
<b>900,000 BOPD RETORT ADDITIONAL</b>											<b>CONSTRUCTION</b>		<b>PRODUCTION</b>

**FIGURE 11**

July 1972  
B. Welchman



LETTER NO. 75

# Utah Resources International, Inc.

709 Walker Bank Building, Salt Lake City, Utah 84111  
Telephone (801) 363-6176 or 363-4391

October 18, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
Department of Interior  
Washington, D. C.

Dear Reid:

It was nice to see you the other day here in Salt Lake, but I am sorry I didn't get a chance to chat with you a little.

A record was made of my testimony at the hearing, and I thought this would be sufficient for your purposes.

I referred to two exhibits which I would include with my testimony, and they are enclosed herewith.


One exhibit shows the amount of oil in the oil shale in the Uintah Basin. The other exhibit shows the amount of pipeline gas contained in the oil shale.

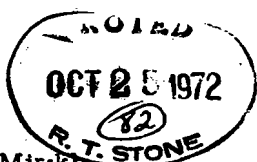
The oil shale could be converted to a high quality pipeline gas "in situ." This is what we are directing our efforts toward. We have such a scarcity of gas compared to the huge demand. And of course gas is a non-pollutant, and would meet the environmental problems best, we believe.

We certainly want to congratulate you and your associates for your very fine efforts in working with industry and the States to help develop an oil shale industry. We truly believe this is in the public interest. In fact, we must become more self-sustaining in our oil and gas requirements.

With best wishes.

Sincerely yours,

  
John H. Morgan, Jr.  
President



JHMjr:kb  
Enclosures

OIL, UTAH BASIN

CHEMICALS, GREAT S. L.

PIPELINE

ST. GEORGE

URANIUM

**Telefax** ^

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FIS THE HON ROGERS C B MORTON, PER DLY ONLY  
SECY OF THE INTERIOR

WASHDC 20240

RE: OIL SHALE LEASING PROGRAM URGE YOU RECONSIDER RECENT RULING  
ALLOWING OIL SHALE LEASES TO GO TO THE HIGHEST BIDDER WITHOU C  
CONSIDERATION TO PROPOSED DEVELOPMENT PLAN. BASE ON  
REPRESENTATIONS THAT TECHNOLOGY AND EXPERTISE WOULD BE OF  
SUBSTANTIAL INTEREST TO THE GOVERNMENT , WE AND SIX OTHER INDEPENT

OIL OPERATORS JOINED WITH GIDKINS INC. AND FORM UNITED  
SHALE OIL CO. THE PARTICIPANTS IN THIS VENTURE FIRMLY BELIEVE THAT AN  
IN-SITU PROGRAM HAS MERIT AND SHOULD BE TRIED. WE URGE YOU TO REVISE  
LEASING REGULATIONS SO THAT TECHNOLOGY AND EXPERTISE CAN BE

WU 1270 (R 5-69)

NOV 7 1972

R. T. STONE

0 1 0

WU 1270 (R 5-69)

**Telefax** ^

2648 126 1-032952C311/2

CONSIDERED AS AN IMPORTANT PART OF THE BID

D D HARRINGTON 701 FIRST NATIONAL BANK BLDG  
AMARILLO TEXAS 79101



OCT 18 1972 (68)

It has been brought to my attention that there is a project in planning to mine oil shale on the Western slope of the Colorado Rockies. As an Environmentally minded citizen I must say that I am one hundred percent ~~the~~ against the project. The environmental effects have not been studied accurately or possibly at all. For instance the project requires that 52,000 tons of processed shale be disposed of daily from a single plant if the 40,000 barrel quota is to be met. Since oil shale expands to one and one-half times its original volume after processing the disposal problem is even worse. Present plans suggest dumping the shale into canyons which directly supports the fact that a poor environmental study has been done. The shale has a high salt content and is low in ~~to~~ nutrients thus the revegetation would be slow and the shale piles would be ugly and cause severe erosion problems. Even if the top soil is replaced salts will rise to the surface again causing restricted plant growth. With the destruction of plant life the wildlife of the area will suffer greatly. Many of the area's animals use indigenous plants for cover and food and any drastic change in their environment would upset the natural balance. Before severe irreversible environment damage is done a intense environmental study needs to be done by competent professionals. In a state who's major income is tourism this project seems completely asinine.

A concerned citizen

LETTER NO. 78  
Michael A. Aulton  
1706 Larch Street  
Port Collins, Colo.  
80521

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd., Arlington, Va.  
22203

OFFICE OF

OCT 19 1972 (48)

HEARINGS & APPEALS

Dear Sir,

I am writting this letter in referance to the proposed development of oil shale resources in North West Colorado. I have been following the idea of the development through sources of the mass media, and have not yet to find any specifis plan or proposal to safe guard the enviroment if such a development should take place. I feel that the development of the oil shale resources demands more consideration on the aspects of degrading effects upon our, already over taxed life support systems.

Before our government stimulates such a project, the public should be informed of the impact it would have on water quality, undue use of water, the air pollution created by the industry and the possible health hazards resulting from the industrial pollution. Revegetation and nonharmful disposal of the shale are two other questions that have not been satisfactorily answered by the sources I have read. I am against the development of oil shale in Colorado or any other state, until such basic questions can be ~~ank~~ answered and the problems they present solved.

A Concerned Citizen,  
  
Michael A. Aulton

COLORADO  
STATE  
UNIVERSITY

FORT COLLINS  
COLORADO  
80521

department of fishery and wildlife biology

October 13, 1972

OFFICE OF

OCT 20 1972 (36)

HEARINGS & APPEALS

Director, Office of Hearings and Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Gentlemen:

I wish to comment on sections related to wildlife in the Department of Interior's Draft Environmental Impact Statement for the proposed Prototype Oil-Shale Leasing Program.

I find it difficult to criticize anything specific in these sections of the statement, for they contain little specific information. The vagueness and poor presentation of information and the failure to evaluate alternative sites for prototype operations constitute a mockery of the intent of the National Environmental Protection Act. If the intent of the Act is to insure that the people may "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences", the people must become informed in detail of the consequences of alternative programs. The Statement lacks detailed information. Impacts upon wildlife are discussed in at least fifteen sections. These sections repeat the same information -- sometimes three or more times. There are many errors of grammar. It is a poor communication.

In Colorado, only two tracts for prototype operations are discussed. This is hardly a consideration of the possible alternatives. The Statement does not compare impacts upon wildlife habitat on tract C-a with impacts on tract C-b. It does not inform the reader whether development of these tracts would produce impacts upon wildlife habitat that are average, above average or below average for the oil-shale region as a whole.

I am very concerned that the Colorado Division of Wildlife Resources did not contribute to compiling this Statement. This agency is responsible for the wildlife resources of Colorado, especially for wildlife habitat. How can an objective impact statement be produced as quickly as this one without input from the one agency most responsible and most informed about wildlife resources of the impact area?



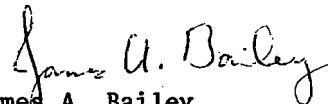
The vagueness of the statement is illustrated by its failure to describe quantitatively the impact of oil shale development on (1) the number of deer, and the number that can be harvested, in Game Management Unit 22; (2) the restrictiveness of hunting regulations necessary to control harvest of a declining herd by an increasing number of hunters; (3) the number of recreation man-days expended in the area; (4) the contribution of these man-days to the local economy; (5) the number of hunters who may change their traditions and hunt elsewhere, thereby increasing hunting pressure in other parts of the state; (6) the number of acres of specific habitat types that will be lost. There are many more examples. If options concerning oil-shale development or concerning tracts for development are to be compared, we must have quantitative predictions of impact on wildlife and on habitat.

The vague commitment of the Department of Interior to cooperate with other agencies in minimizing impacts of oil-shale development upon wildlife (Vol. I, p. IV-16) is not satisfactory. An estimate of the costs of revegetating habitat is not given. An estimate of the cost of research needed to develop methods for minimizing impacts is not given. These costs should be estimated to alert agencies and budget committees to the realities of the Department's commitment.

There can at this time be no assurance that disturbed sites and tailings piles can be revegetated with plants supplying critical forage to wildlife. Revegetation in this arid environment may take centuries. This is not made clear. If water is necessary to establish vegetation, how much water will be necessary? How much water is available for this purpose? Reasonable approximations of these data are available, but not given in the Statement.

In summary, I believe the Draft Environmental Impact Statement for the proposed Prototype Oil-shale Leasing Program has been assembled hurriedly and quite inadequately. It does not inform the public of its options nor of their consequences. It only fulfills the requirement that an impact statement be submitted before leasing may begin.

Sincerely,



James A. Bailey  
Assistant Professor  
Wildlife Biology

JAB/njr

cc: Several

LETTER NO. 80

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va.

Dear Sirs:

I am greatly concerned about the development of the Western slope of Colorado for the purpose of tapping the oil shale resources in the area.

As a student I feel that the industrial development of that region will cause an environmental catastrophe. The Western slope is one of the few undeveloped areas left in Colorado and I would like it to stay that way.

This area supports one of the largest deer herds in the world, and in one of the last domains of the now diminishing species of mountain lions. The effect the development of this area upon the wildlife and ecology will be irreparable. The ever threatening problem of the pollution of the Colorado River will also be increased.

This area is one of the few places left in the United States where man has not intervened with nature, to such an extent to affect the ecological balance of nature. I demand, as a concerned environmentalist, that we leave the area undeveloped so that future generations will be able to enjoy the aesthetic and the recreational value of this region.

I realize that there are political, social, and economic aspects to this problem but the biological point of view is of the greatest concern.

Although this area is rich in energy resources I demand that it remain an area rich in environmental resources. I suggest that another answer to the energy shortage problem be found and the Western Slope of Colorado be kept undeveloped for future generations to relish its exceptional beauty for all time.

Identical letter sent in by:  
Reference Nos.

84, 92, 101, 105, 109, 110, 111,  
112, 115, 119, 132, 133, 135, 141,  
157, 164, 169, 180, 187, 192,

Thank you,

Barbara Barnhart

#265 Ellis Hall

Fort Collins

Colorado

26

LETTER NO. 81

Nov. 2, 1972



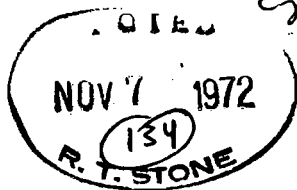
Mr. Rogers Morton  
Secretary of the Dept. of the Interior  
Wash. D.C.

Dear Sir,

The Dept of Interior environmental  
~~impact statement for the Bel Shale Development~~  
Project is inadequate and at the very  
<sup>should</sup> least, give careful analysis of the  
problems the development would cause  
for wild life flora and fauna.

As concerned citizen,

Margaret Batile



NOT ACKNOWLEDGED DUE TO LACK OF RETURN ADDRESS.



# Telegram

LLB064 WAG151(0937)(1-006680C309)PD 11/04/72 0932 NOV -4 AM 9:58

ICS IPMPHJA PTL

ZC ZC 01051 NL TDPR LANDER WYO 100 11-03 11-03 410P PST LETTER NO. 82

PMS HONORABLE ROGER C B MORTON PHONE AND MAIL

SECRY OF INTERIOR INTERIOR BLDG *llh of Guard*  
WASHDC *19 + c. Stone*

OIL SHALE ENR ENVIRONMENTAL IMPACT STATEMENT NOT  
ACCEPTABLE. DELAY OF TWO YEARS TO AWAIT ANSWER FROM  
STUDY UNDERWAY IN COLORADO NOT UNREASONABLE. REQUEST  
YOU DEFER LEASING PROGRAM

TOM BELL EDITOR HIGH COUNTRY NEWS



LETTER NO. 83

310 19th Street  
Boulder, Colorado 80302  
4 Nov 1972

Rogers C. B. Morton  
U. S. Department of the Interior  
Washington D.C. 20240

Dear Sir,

I am concerned with the Department of Interior's administration of the oil shale hearings. I was displeased to find the Department conducts itself before the public as if it were a special interest group. I suggest that the practice of holding hearings--as in the case of the Denver hearings--during working hours when the majority of the interested citizens are unable to attend cease. If the Department is concerned about overcrowding or dissention I think televised hearings might be a solution.

With regard to the leasing program, once the prototype operation succeeds there will be too many precedents, too much momentum, and too much money invested to follow any other course than to proceed with full development regardless of the damage.

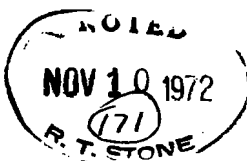
The DEIS does not present enough information to convince any knowledgeable person that environmental protection is possible. Revegetation has not been shown to be effective; salinity and quantity of ground water to be dealt with are unknown; and water consumption estimates indicate that the effects will extend far beyond the immediate leasing areas; can be cited as only a few examples. There are too many unknowns to allow a project that will devastate 17,000 square miles of land underlain by potentially economical deposits to proceed. These lands have a greater value as they are today than as a source of some 4% of a few decades of wasteful energy consumption.

I suggest that before any leases are granted for oil shale prototype development that the government institute a national energy resources and conservation council to inventory our energy reserves and to make sensible decisions based on fact as to how they should be used.

Sincerely yours,

*Dan W Bench*

Dan W. Bench



*Certified Mail # 137608*



OFFICE OF

OCT 24 1972 (53)

HEARINGS & APPEALS

Mr. Dennis E. Bires  
119 Wishart Dr.  
Beaver, Pa. 15009

James M. Day  
Dir. of Off. of Hearings and Appeals  
Dept. of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Mr. Day:

I am writing this letter in protest of the Interior Dept. decision to lease large portions of Bureau of Land Management land to certain oil companies for oil shale development in western Colorado. I believe that the Environmental Impact Study for this project was badly deficient in many areas. These include: dams and water transfer projects, increase in local population resulting from operation, power plants to supply electricity for project, quantification of resultant air pollution, and results of unemployment created when project ends.

Because of these deficiencies, I must register my insistence that the Oil Shale Development in Colorado be cancelled. Only after considerable further study should the project be reconsidered.

As I was unable to attend the public hearing for this project on Oct. 10, I am writing this letter in place of a statement at the hearing. Please include this letter on the hearing record. Thank you.

Sincerely,  
Dennis E. Bires

Gentlemen

It has been made aware to me that on the Western slope of Colorado there are proposed plans to open an open pit oil shale mine. I am an environmentally concerned citizen and I therefore strongly protest the development of these oil shale mines on the grounds that the waste material will not be properly handled and will be detrimental to the surrounding wildlife.

As I understand it the present plans are to deposit the waste by filling canyons. I think this is literally insane! The waste shale is very high in salt content and very low in essential nutrients to allow revegetation and thus will create an ugly eyesore and cause erosion. This deposit of shale in the canyons will also have negative effects on the wildlife if it destroys their natural habitat, which it undoubtedly will do. I therefore plead with you to stop plans of the proposed oil shale mines until it can be done in such a manner as not to harm the environment in any way.

OFFICE OF

OCT 19 1972 (70)

Sincerely!

Laurence M. Boehme

HEARINGS & APPEALS

12 Woodside Rd.  
Fayetteville, N.Y. 13066  
Nov. 1, 1972

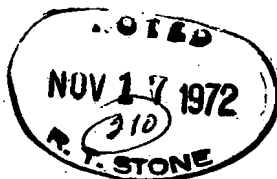
The Hon. Rogers C.B. Morton  
Secretary, Department of Interior  
Washington, D.C. 20240

Dear Mr. Morton:

It is our belief that the environmental impact statement by the Department of Interior on the oil shale development program is inadequate. It should at the very least give much more careful analysis of the grave problems the development would cause for wildlife, both flora and fauna.

Very sincerely yours,

*Marian and Gordon Bond*  
Mr. and Mrs. G.V. Bond



OCT 24 1972 (47)

October 21, 1972

Dear Sir;

I am writing to voice an objection concerning the plans for the oil shale mining project in north-western Colorado. I think that a great deal of damage can be done through the spoiling of the water. The land in which the oil shale project (O.S.P.) is to take place is partial desert, as is most of the west, and water is a very important, hard to get necessity. Some people must tap water from long distances, and many people are depended on the water in north western Colorado. Not only are the people in that adjacent area dependant on the water in that area, but so are people all through the southwest. That water is an important tributary to the Colorado River and large cities such as Phoenix and Los Angeles use the Colorado's water. The O.S.P. would raise the solinity of the water so as to spoil it for the local inhabitants, and it would significantly lower the quality for the nine million other people who use it. Through the water the O.S.P. would upset the ecology for an enormous area.

The O.S.P. would be injuring to the ecology in many other areas too. The acidity of the soil (caused by the lousy water) would damage the vegetation. It could kill off much of the wild life. The remaining pit after the is exhausted would be an irreparable scar. What is now a lovely area could become a desolite wasteland. I don't beleive man has the right to do that.

I do realize that the U.S. needs oil, as does the rest of the world, but ruining our enviroment can be a very high price to pay, perhaps too high. The method planned to be used to extract the oil from the shale was once considered economically unfeasible, only inflation changed that. There are other methods that would be envirmntally less damaging, but they are now economically unfeasible. Technology will bring down the price of those operations in the future, I seriously suggest waiting until that day that oil shale won't run away.

Thanks for listening,

Margaret Browne

SOUTHWESTERN STATE COLLEGE

Weatherford, Oklahoma 73096



DEPARTMENT OF CHEMISTRY

October 16, 1972

OFFICE OF

OCT 20 1972 (43)

HEARINGS & APPEALS

Director of the Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Sir:

My knowledge of the oil shale situations is quite limited. The sources of my informations are the news releases of the Department of Interior, journals of the American Chemical Society and newspapers. These sources being somewhat indirect do not qualify me as being knowledgeable. However, there are several things I would like to suggest.

First, I think more emphasis should be placed on the development of nuclear fuel. The energy spent on developing oil shale might be more wisely invested in nuclear fuel technology. The main advantage of nuclear fuel is that more energy per unit mass can be obtained than from other energy sources. The main disadvantage is the radioactive waste that results when the fuel is spent. New technology could possibly solve this problem.

My second concern is for the area where the oil shale deposits are. If adequate pollution control is imposed on the companies involved then my fear would be lessened. However I fear that restoration of the mined area, and degradation of the air and water quality will result. Thus I would advocate stringent controls on the development companies.

Thank you for your consideration.

Sincerely,

*Stuart Burchett*

Stuart Burchett

SB:cjr

LETTER NO. 90

Box 99 RFD#

Jefferson, Ohio

October 28, 1972

Secretary of the Interior  
Washington, D.C.

Dear Sir.

Please take into consideration history. This is a letter of concern for the area of the oil shale. The government seems to want the public's opinion, so here it is, mine anyway.

I have never seen a canyon, let alone those in Colorado, Wyoming and Utah. I have seen pictures and films but the <sup>real</sup> thing is usually far more breath taking.

Please note that I am not against the idea of getting oil out of rocks or shale. But please do not destroy the beauty of what God put there. I know that I'm not like others, if it cost more to keep the land and animals I would rather spend the extra money.

I understand this is progress, however so was the train. In taking a look at history one can see the damage done. The buffalo was near extinction, not just because of the rail road but certainly it did not help matters. This is only one example, I hope it will be enough to help you and the people involved in looking towards a better way of getting the shale besides strip mining.



In a report published by your office it was said, "The development of an open-pit operation would provide a scenic view which would increase tourist traffic." Which is more beautiful a young girl's face with scars or one without, I hope the question's answer is proof of my idea.

Please give us oil from shale but do not take away the beauty and the animals, as we look towards tomorrow let us not see the damage of our haste.

Sincerely yours

Tom Burris, just concerned

A handwritten signature in cursive script, reading "Tom Burris". The signature is written in dark ink and is positioned below the typed name.

2130 W. Prospect St

F.A. Collins, Editor

Oct 26, 1972

Director of Hearings and Appeals

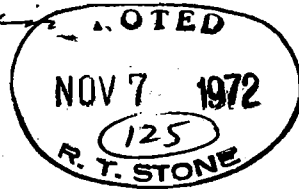
Department of the Interior

4015 Wilson Blvd.

Arlington, Va. 22203

Dear Sir,

LETTER NO. 91



I am a resident of the state of Colorado an Agronomy graduate student and a member of the 3rd Population Growth subgroup of the Colorado State University Environmental Corps. I am writing in regard to the proposed oil shale development in Colorado.

More people cause more consumption and of course this consumption requires the use of more energy. The U.S. has reached the point where oil shale has to be considered to fill the energy demand. It appears to me there is a misplaced set of values here. A crash program of shale development in areas such as the Piceance Basin of Colorado as outlined by the Dept



environmental impact statement  
is only a temporary solution to  
the underlying problem. I certainly <sup>91</sup>  
hope more consideration will be  
taken as to the effect on the delicate  
ecosystems present in the areas  
needed for shale development.  
I ~~believe~~ believe that reduction  
in the consumption of energy should  
be studied before ways of increasing  
the availability of energy resources.  
Many ways of reducing energy  
use, such as mass transit systems,  
are present and if oil shale is  
not just used as a temporary  
bandage to an energy crisis, then  
possibly these energy reducing  
systems will be given more  
preference.

Sincerely

Scott Campbell

Nov. 4, 1972

Dear sir,

I am writing in concern for the proposed Oil Shale developments in Colorado, Utah and Wyoming. Would you please include my comments in the official hearing report.

Through extensive reading I have decided that we are not looking into every potential problem throughly. I would advocate holding off on the planned December, 1972 leasing of concerned state lands for Oil Shale development. This should be done until all problems have surfaced through proper scientific investigation and have been properly solved.

It is the concern of many citizens, including myself, that the United States maintain a proper production of energy, but this should not be at the expense of causing irreversible environmental and social damage. It is quite possible that such problems could occur if not fully studied.

I do not urge a condemnation proceeding but just a holding period. This should allow us to step back and look at the question rather than yielding to impulsive action.

Thank you very much for your time and consideration.

Sincerely

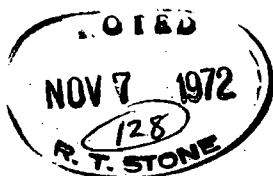


Mr. Doug Caulfield

2207 W. Oak Ct.

Apt 1912

Ft. Collins, Colo. 80521



10-20-72

OCT 24 1972 (69)

LETTER NO. 94

## HEARINGS &amp; APPEALS

James M. Dary

I am strongly opposed to the oil companies developing the oil shale deposits in Colorado - near Grand Junction and Rifle, Colorado. Furthermore I don't feel that the vast majority of people in Colorado would want to see this happen. It is too bad that they, the public, are ignorant of what is happening because the Dept. of Interior is trying to sneak it by. There is or was hardly anything in the Denver Post, Boulder Camera or television about the facts of what would happen to this area if it were mined. Nobody, including me, was even aware of the Public Hearing concerning the fate of this land.

My major reason for objecting to this project is - We don't really need that oil and fuel oil. This deposit will only produce a small amount of oil, ~~relatively~~ to other oil deposits. I don't think we should destroy one natural resource which is very rare (wilderness) for another resource (oil) which isn't nearly as rare.

Kevin Carney

over

P.S. At least the people should know what is happening to them, before this land is mined.

P.S. I include an Oil State Hearing Record, please.

NOV 9, 1972

NEARBY S. STOKES



Dear Sirs:

My name is Cliff Chambers. I am a student at Colorado State University in Fort Collins, Colo.. I would like my following comments to be entered into the official record.

Social Aspects of Oil Shale

I strongly feel that the social consideration of the Section of the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program entitled "Impacts on Existing Economic and Social Environment" is more than inadequate. How can five pages in a report that outlines a major proposed action that may alter the environment of the area be sufficient in talking about social considerations. My complaints of this are as follows:

1. The report gives a fairly concise estimate of how many people will migrate into Colorado towns such as Rifle, Meeker, and Grand Junction. What new facilities will be needed for this increased population? The Draft Statement states "The expansion of public facilities in Grand Junction necessitated by this population increase may be difficult.....2 as a solution. What do you mean by this statement? Will public facilities be built? If so, what kind of facilities will be needed? Schools, hospitals, libraries, etc. will be needed if you increase the population by sixfold in some of the Western Slope towns. I want to know who exactly is going to fund these services.. After all, with such a population influx the environment will be altered in the individual towns and MUST be covered in the C (102) statement.

X- SUBLOTER W/BACIL

2. "The three Colorado counties have formed an Oil Shale Advisory Board to Study the regional impact of an oil shale industry and to advise the individual counties of their findings." What will the Planning commission or Advisory Board have power to do? Will the environment of the area be adequately covered by these county commissions?

3. "Rio Blanco and Mesa Counties have adopted zoning ordinances with high quality standards for subdivisions and mobile home parks." Will these high quality standards be able to stand up under the pressure of a population increase? Since subdivision construction and development might be considered a major action having adverse effects on the surrounding environment, I feel a detailed statement must be supplemented in the final impact statement. This supplement must include a systematic, interdisciplinary approach of the environment directly dealing with the subdivisions. The public must also know how many lots in the subdivision will be built? How large an area will the subdivisions cover?

4. "Zoning and planning can control the quality of new urban development." A detailed outline of these controls are needed.

5. The statement talks about how such "large scale growth can result in a town having an entirely different ethnic, cultural, and religious composition after expansion than it had before." Is the physical environment the only consideration required by the Draft Environmental Impact Statement? Social conditions directly dealing with the physical change of the environment must also be considered. You cannot ignore the lives of some <sup>POTENTIAL</sup> sixty-thousand inhabitants of this area. Details in this

area are again needed and not provided for in the Draft Statement.

6. The question of temporary population growth and dispersal must be dealt with. In the past the oil industry has proved to be a boom-then-leave sort of operation. In another words, it is feasible that the prototype program might be started, then if proved unsuccessful terminated. Even if the prototype plant producing oil shale has a life of 10 years, when the prototype program is ended, what happens to the inflated towns when the population suddenly leaves. This should be mentioned in the final statement. What safeguards will be made to prevent such a temporary town occupation?

7. Existing roads come within 16 miles of tract c-a and one mile of Tract C-B. How many roads will have to be built for commuting to the prototype plants? How will these roads affect the environment they traverse? Since these roads having to be built are need for oil shale, the environmental impact statements should be included in the final C(1020) impact statement, not at another time. What about support roads in the growing towns in the oil shale region? As the town grows, roads will have to built in the towns. Mention of the construction of the roads in the townsmust also be considered.

. My first ~~several~~ complaints of this section in the Draft Statement were at least mentioned. The following considerations were not touched upon in this section, and should have been.

8. Where is the water going to come from to satisfy the clean water needs of a growing town. Where will the inhabitants of towns such as Rangely get their water. How will this water be transported? Will the transportation of the water affect the

the environment? If so, a full report of the effects must be included in the Final Impact statement.

9. What about the transmission lines to be built to handle additional population increase and their electricity needs? What affect will the transmission lines have on the social environment in the towns affected by the prototype program in Colo..

I feel the soaial environment, and the result of altering the physical environment to the social environment must definitely be reviewed with much more detail in the fine areas I have just mentioned.

#### Part 11

#### Oil Shale and Colorado : Population Growth

It is generally noted that Colorado's population will increase by 1.6 million persons by the year 2000 without oil shale development. In March, 1972, the Colorado Environmental Commission urged Colorado to encourage "any industry locating in Colorado to employ Local or indigenous skills and talents rather than importing new." What about the in-migration (briefly mentioned in Vol. I; p. III-82) of out-of state workers in Colorado. for the oil shale prototype program. I feel this subject should be more comprehensively covered in the Fiaal Impact Statement.

The Draft Statement makes no considerations for a fully-developed oil shale industry in Colorado. A prototype program is the testing ground for the technology of oil shale. After the prototype program would come full development of the oil shale resources. What impact would a fully-developed oil shale industry have? I feel this must be considered in the Final Statement.



Vol III, p. IV-55

Vol III, p. IV-56,57

Vol III, p. IV-57

Vol III, p. IV-57

October 4, 1972 LETTER NO. 96

Rogers Morton  
Secretary for the Interior  
Department of the Interior  
Washington, D.C.

Dear Secretary Morton:

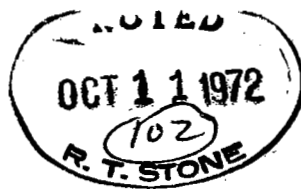
I am writing this letter to urgently request that you declare a moratorium on the development of oil shale in Colorado, Utah, & Wyoming. The report on the environmental impact of this development certainly indicates the necessity of studying this program much more thoroughly.

I've lived in Colorado all my life; I love it dearly. Please reconsider your department's recommendation in this matter.

Yours Truly

Glen Clifford

4820 T-Bird Circle #209  
Boulder, Co 80303



from letter 10/11/72  
Ack. 10/11/72  
nm

LETTER NO. 97

1204 Skains  
600-30th St.  
Boulder, Colo. 80302  
October 17, 1972

James M. Day  
Director of Office of Hearings + Appeals  
Dept. of Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

OFFICE OF

OCT 20 1972 (31)

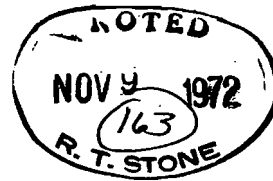
HEARINGS & APPEALS

Dear Sir:

I would like you to know that I am a concerned voter in Colorado who hopes that you can hold back development of the oil shale in Western Colorado until further research can be done and all alternatives are checked out. I would like this letter to be placed on file in the record of hearings and appeals. More studies are needed before action can take place. Thankyou.

Sincerely yours,  
Deane E. Colgrove

10/30/72



Office of hearings and appeals  
4015 Willson Blvd.  
Arlington, Va. 22203

ATTENTION MR. JAMES DAY, DIRECTOR

Dear Mr. Day:

I should like to make personal comment regarding the current draft environmental impact statement concerning oil shale development on public lands in Colorado, Utah and Wyoming. I should also like to request that this statement be included in the official hearing record.

I have read the statement completely, have spent much time trying to understand the material covered and have come to the conclusion that the statement is not only inadequate in its coverage of most of the considered material, but has left enormous amounts of considerations completely unmentioned.

This neglect of numerous considerations is the fault of the document. I submit the question, How can the environmental impact of such a project be realistically determined when the impact on adjacent lands has not been considered? In fact, how can the impact on adjacent lands be determined if such things as water consumption by the operating industry has not been accurately estimated?

I respectfully submit that the draft environmental impact statement be rejected until a complete and accurate study be made.

Respectfully,

OFFICE OF

NOV 6 1972

*J. Blane Colton*  
J. Blane Colton  
593 S. Ogden  
Denver, Colo. 80209

HEARINGS & APPEALS

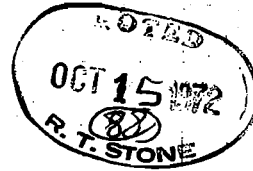
10-12-72

Honorable Roger Morton  
Secretary of the Interior  
Washington, D.C.

Reed Stone  
Rm. 7000

Dear Sir:

Re: Oil Shale Exploration  
in the West



I note hearings for Pilot Plant Sites  
(best oil shale deposits on Public  
Lands) are soon to be held.

If the West has to be torn apart  
to secure more oil and coal I  
feel it is time to cut back on use  
of the large cars and unnecessary  
driving (tens and drunks drive  
around our cities all night) also  
why aren't we cutting back on use  
of electricity and appliances which  
are not absolutely needed. To just  
keep on purchasing more and  
more ones does not really need  
and continuing unnecessary driving  
could run the country out of  
its resources besides destroying

our earth.

Mass transit and rail travel would certainly solve the problems regarding use of gas and oil. Can't our Government finance mass transit instead of despoiling the West and Alaska.

Can't understand why no consideration given to anything except more oil, more hi ways, more and larger cars, and more electricity.

Anything practical such as mass transit and good railroads seems to be pushed aside. Never any thought to retrenching—

It doesn't look like the government and Interior Dept. can solve problems for the frustrated people - just create more new ones.

Sincerely,  
William Conrad

Mr. Day,

As a citizen and therefore as much an "owner" of the public lands as the President or any Senator, I am writing to express my opposition to the granting of permits for oil shale mining in Colorado or Wyoming. By my way of thinking the only people who will benefit from such activity are the oil companies and any politicians or bureaucrats they bribe to support them.

Policy makers such as yourself must come to realize that we are the environment and polluting it is polluting us no matter what the short run gains to the oil companies might be.

I am a Coloradan and  
a U.S. Citizen and I  
am opposed to oil shale  
mining on public lands,  
period.

Don't sell out Colorado.  
If there is less oil available  
prices will go up and  
people will buy smaller  
cars with smaller  
engines which pollute  
less. This is the case  
in Europe. I myself  
do not drive an automobile.  
I ride a bicycle. I do not  
care if the oil industry  
falls on its face tomorrow.  
You may consider my  
view extreme but  
under the Constitution  
it carries as much weight  
as anybody else's.

Please, No Permit.

Sincerely, Robert M. Crowe  
1212 Pine, Boulder, Colo.



760 Clermont  
Denver, Colorado 80220

Mr. James Day  
Office of Hearings Appeals  
4015 Willson Blvd.  
Arlington, Virginia 22203

October 7, 1972

Dear Mr. Day:

We are writing this letter to register our opposition to the proposed oil shale mining on public lands in Colorado. We would like this letter included in the hearing record and we also suggest that there be a 30-day extension for public statements.

We oppose the oil shale mining proposal because of its immediate-and long-range potential for grave ecological damage. Moreover, as the oil companies already own 20% of the oilshale land in the country, we see no reason that they use public land.

We feel that the oil shale mining proposal reflects a most irresponsible attitude on the part of the government and the oil companies.

Sincerely,

*John A. Dann*  
*Susan Dann*

John A. and Susan Dann

OFFICE OF

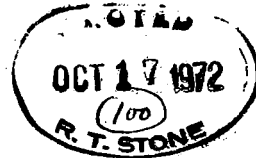
OCT 13 1972 (58)

HEARINGS & APPEALS

1312 Morgan Street  
Fort Collins, Colorado 80521

October 13, 1972

Reid Stone - Oil Shale Coordinator  
Dept. of the Interior  
Office Asst. Sec. for Min. Res.  
Room 7000, Interior Bldg.  
Washington, D. C. 20240



Dear Sir:

Re: Volume II, Draft Environmental Statement for Oil Shale development in Colorado, Utah, and Wyoming; supplement to Letter of October 9, 1972, commenting on Volumes I and III.

Reference is made to Chapter V, "Alternatives to Oil Shale Development," and its predecessor, "Alternatives to the Proposed Prototype Oil Shale Leasing Program" [Chapter VIII of June 1971 preliminary Draft Environmental Impact Statement]. The latter treats alternatives in three double-spaced pages; the former in eight, adding and justifying a fourth alternative, "open-leasing of public lands" [60-61]. The first alternative is of particular importance to the general public, the owners of the lands and minerals at issue:

1. Government Development of Public Oil Shale Lands - There are a number of possible options for Federal development of the Nation's oil shale resources, including: (1) a government-financed demonstration plant; (2) a joint government-industry effort, in which costs are shared equally; (3) a government corporation, modeled upon COMSAT (the Communication Satellite Corporation); and (4) a government organization modeled after the TVA (Tennessee Valley Authority).

Precedent exists for each of the four options for government development, but none of the alternatives that involve extensive government participation are authorized by existing legislation as it pertains to oil shale.

At this point the two draft documents differ:

June 1971

"Both additional legislation and substantial amounts of money must be provided by Congress for any of these options to be viable...."

September 1972

"Clearly, it is not the intent of Congress to establish such a precedent as it pertains to ~~mineral~~ mineral resources...."

The public interest requires close scrutiny of the political implications in the September 1972 statement.

*Acc. from H.R. 10/15/72  
(rec)*

October 13, 1972

The alternatives, in addition to government development, are set forth as follows on page 60 of Volume II:

...the second is for the Government to take no steps to develop oil shale resources on public lands; the third is for the Government to postpone development of the public oil shale lands at present, but to re-assess its position at regular intervals, with a view toward potential development at a future date; the fourth is open-leasing of public lands....

All four of these so-called "policy" alternatives are, as stated on page 61, "considered briefly." In light of Calvert Cliffs v. AEC and subsequent decisions interpreting the National Environmental Policy Act, together with Guidelines issued by the Council on Environmental Quality, this treatment is inadequate.

The foregoing letter is submitted, along with the previous letter of October 9, for inclusion in the Final Environmental Statement.

Sincerely yours,

  
Doris Dawdy

1312 Morgan Street  
Fort Collins, Colorado 80521

October 9, 1972

Director, Bureau of Land Management  
Department of the Interior  
Washington, D. C.

Dear Sir:

Re: Draft Environmental Statement for Oil Shale  
development in Colorado, Utah, and Wyoming.

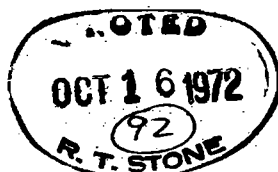
Reference is hereby made to Sections 101(b) and 101(c) of the National Environmental Policy Act. The latter section provides that "each person has a responsibility to contribute to the preservation and enhancement of the environment." With this in mind I submit the following suggestions for inclusion in the Final Environmental Statement:

"Alternatives to Selected Tracts" [Vol. III, Chap. IX] are briefly treated in 4½ double-spaced pages. In light of Calvert Cliffs v. AEC and subsequent decisions interpreting NEPA, together with Guidelines issued by the Council on Environmental Quality, this treatment is inadequate.

Justification for the six proposed Tracts is based upon their potential for developing methods of oil shale mining. "Selection of Fewer Tracts," an alternative described in one paragraph, appears on IX-2, followed by an alternative of similar length entitled "Selection of More Tracts."

Throughout Volumes I and III one is impressed with the total and irreversible impact of the proposed prototype program. Follow-up research of source material and interviewing of experts who contributed to formulation of this massive Draft Environmental Statement do not allay the fears of the concerned citizen. Therefore I submit for consideration the following unexplored alternative, based on the mandate of NEPA, Section 101(b), subsections (1), (2), (3), and (6).

Tract C-a [Vol. III, Chap. VII-2] is suitable for open-pit mining; nahcolite pods exist below the land surface, and "about 500 ft. of the lowest shale zones contain dawsonite in varying amounts" [Chap. VIII-1]. The Draft Environmental Statement continues as follows:



October 9, 1972

Technology and economics for processing these shales for minerals recovery are still in the research stage. However, by the time sufficient quantities of oil shale are being extracted it is reasonable to assume that processes for minerals recovery will have been developed. Alumina recovery would have significant national importance since the United States now is almost totally dependent on foreign sources for its supply of aluminum uses. Naheolite could have significant local importance, i.e. on-site or in the Four Corners area as a means of reducing sulfur oxides and other noxious components of industrial stack gases...."

A governmental policy designed to "attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences" [NEPA 101(b)(3)] can best be implemented by permitting one large open-pit prototype operation at this time in which the Federal Government would supervise the mining phase of the operation. In this way control would be maintained over (1) the actual excavation of shale and intermingled sodium minerals; (2) the methods utilized in returning spent shale to excavated pit areas so as to guarantee protection of ground and surface waters; (3) restoration and landscaping of affected areas; and (4) the disposal of leachable solid salts. (These are 75 square miles of the Piceance Basin underlain by halite, rock salt, up to 300 feet thick [Draft Environmental Statement-I, Chap II-68 ( $1.5 \times 10^{10}$  tons of halite)].) Parenthetically, there may even be an alternative to canyon storage--now considered unavoidable--by actual construction of hills and cliffs with the spent shale in order to provide a habitat for presently existing wild life, and to restore the mined area to its present scenic condition.

Privately-owned construction firms under government contract could handle the mining phases of the operation. Retorting would be carried on nearby by any number of companies interested and/or involved in developing fuel supplies on a commercial basis. The grade of ore could be blended from a large pit to maintain a nearly uniform grade. The pit could be scaled in size to meet the needs of all the retorts. The public would be reimbursed by each of the retorting companies with a reasonable royalty for the actual shale processed in its plant. Spent shale would be returned to the pit where it would be compacted and landscaped.

Other proposed Tracts in Utah and Wyoming, already having an adequate water supply for oil shale and mineral development,

Director, BLM--3

October 9, 1972

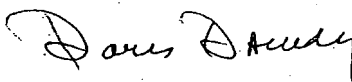
which Colorado does not have, might be preferable to Tract C-a. However I have not had time to research their potential. As a Colorado resident I am best qualified to make suggestions based upon my knowledge and observations of the area in which Tracts C-a and C-b are located.

Although Tract C-b has potential for room-and-pillar mining, the wastefulness of this method in which substantially less than 50% of the deep shale will be recovered, and the threat of subsidence, make it much less desirable than open-pit mining. (It may seem like an interesting experiment to place spent shale in the cavities, but to place it under ground in a compacted state is at this time fraught with unknowns; likewise the side effects of in-situ mining, though far less environmentally defacing on the surface, are fraught with unknowns. An in-situ process recovering more than 15% of the oil could cause land subsidence.)

It is readily apparent that so environmentally damaging an operation as oil shale mining should proceed only with a plan designed to stringently limit the area of devastation at any one time; to properly utilize all the natural resources, including all the available shale in the Tract; and to restore that devastated area to one suitable for recreation and wildlife. When that has been accomplished we will know where we stand.

The proposed lease, limited as it is by existing laws of ancient heritage, cannot meet the needs of a country belatedly learning that it must reserve much of its natural resources for succeeding generations as required by the National Environmental Policy Act.

Sincerely yours,

  
Doris Dawdy

LETTER NO. 104

Oct. 31, 1972

Box 95  
Leadville, Colo.

Secretary Rogers C.B. Morton  
United States Dept. of the Interior  
Washington, D.C.

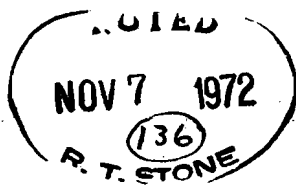
Dear Sir,

I strongly protest the proposed oil shale leases in the Piceance Creek Basin northeast of Grand Junction. Such development can only be, at best, a stopgap measure in the fuel crisis facing this country.

I see no point in destroying one natural resource, our deer herds, in order to exploit another resource, one that may be impossible to develop because of lack of yet another vital resource, water.

Sincerely,

  
Corinne Diemer



8810 Birdwood  
Houston, Texas 77036

November 9, 1972

Rogers C. B. Morton  
Secretary of the Interior  
Washington, D. C.

Dear Mr. Morton:

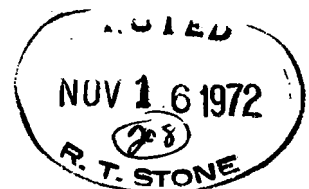
I would like to discourage you from leasing 30,720 acres of Federally owned oil shale deposits in Colorado, Utah and Wyoming. Strip mining has already devastated the Southeastern United States, in the search for shallow coal deposits. If you start strip mining oil shale down to a depth of 850 feet, there will be no end to the destruction of the environment. The long-term answer to the energy crisis lies in a combination of birth control and a reduction in the per capita consumption of energy, by eliminating wasted energy.

Sincerely yours,



Bev Edwards

BE:sd





LETTER NO. 107

2037 W. Plum C-4

Ft. Collins, Colo. 80521

Dear Sir:

I am writing this letter in reference to the Oil Shale development in the Piceance Basin of Colorado.

I feel that the project could have very serious effects on the natural environment in the area. It seems that there are already many things threatening the natural areas of Colorado including spreading populations and over use of water resources. Please send me any current information on the oil shale project. I ask you to further consider the environmental consequences, before going ahead with plans of mining the shale.

Sincerely yours,

Nancy Edwards

Box 621

Georgetown, Colo. 80444

Sept 27, 1972

To Whom It May Concern:

We are in favor of an Oil Shale Industry in Colorado. It would be a great asset for Colorado and the U. S. A.

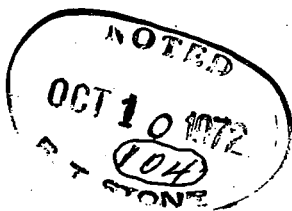
It would create more jobs, help the energy crisis, put more money into circulation, and will help the population explosion by having people move into the western slope where there is plenty of room, instead of the already congested front range area.

Many people are hopefully looking forward To the Oil Shale Industry.

The world needs oil for progress, and Colorado is fortunate to have this resource available for everyone.

Sincerely Yours,

Mr & Mrs. Wael Engert



LETTER NO. 113

Secretary Rogers Morton  
Department of the Interior  
Washington, D.C. 20015

Dear Mr. Morton,

I understand that an oil shale development is proposed for the Piceance Basin. If this was developed, the air and water of the Flattops area would be polluted because of its close proximity. It is more important that the Flattops area be saved, than the Piceance Basin area be totally destroyed.



Sincerely,

Randilyn Forselius

Mr. James M. Day Director  
Office of Hearings and Appeals  
4015 Wilson Blvd.  
Arlington, VA 22203

OFFICE OF

NOV 8 1972



HEARINGS &amp; APPEALS

Dear Mr. Day,

Thank you so much for granting an extension to the date when comments on the Environmental Impact Statement on Oil Shale Development were due. I wonder if you had any idea how difficult it would be to obtain copies of the statement? In this area, at least, you certainly had a 'best seller' with corresponding difficulty in finding a copy.

My comments may seem housewifely and mundane compared to the experts who have been submitting comments which is only natural because I AM a housewife and there are housekeeping aspects of the statement that do concern me.

It is difficult not to sound all women's lib when I make the following point perhaps because women and housewives do have valid viewpoints although they hardly agree with the thought processes of an engineer. As a wife and mother of three teen-age sons I think I can state with some authority that men can get so carried away with some project and so elated with its success that they just sort of forget about cleaning up afterwards. It IS something of an anti-climax after a great achievement to descend to the boring, nitty-gritties of cleaning up the mess. Maybe the mind that can deal in large concepts is simply incapable of focussing down to the details of messy aftermaths, which is why mothers turn gray and executive secretaries earn good salaries!

I think this situation applies to the Impact Statement on Oil Shale Development. Solving the big problem of extracting oil from rock has short-circuited any reflective thinking on the whole program. I know I should be thankful that at last Environmental Impact statements are required, and I am, but I think that those involved need more practice.

Example: there is an impressive program for taking all sorts of measurements of the Colorado River and its' water shed--flow rate, salinity, sedimentation--quite comprehensive. But NOTHING is said about what is to be done with these figures!!! No where is there any program for remedial action should all these measurements indicate that a critical point has been reached or passed, nor is there any basic field data with which to make comparisons.

Now that is just foolish! Any program that ~~fixes~~ fails to consider the factors that can go wrong, and what can be done to prevent them, is only half a program. We must know who would have the authority to halt the program should,

for instance, increased downstream salinity prove detrimental to crops, stock, and wild life. In fact, I'd like to know if there is ANY consideration, or any criteria, for such a situation.

I'll bet that, if oil shale development prove economically unsound, there would be little delay in closing the program until a better method, or source, was found. If oil shale development proves ecologically unsound, there is no assurance, nor authority, to invoke a similar cease order,

The lack of such a provision is, I hope, a serious oversight and not deliberate in which case I should be forced to wonder if the environmental impact statement, the hearings and invitations for written comments, are but empty gestures, a big put-on. Oral and written statements are exercises in futility if decisions have already been made to proceed, regardless of adverse discoveries.

Other things that bother me: The compacted slopes of spent shale are to be protected from hard surface run-off by conduits around them to catchment dams below. What agency, or company, is going to maintain these permanent features, and for how long, and at what cost to the public???? Should they ever be abandoned, those slopes will immediately become vulnerable to the normal erosional process; after all, that is exactly how those box canyons were formed in the first place!

It's accepted that this spent shale sets up something like concrete when it has been wet down, compacted, and allowed to dry, but, even concrete has a predictable life-span. Are these slopes to be maintained in perpetuity? Or will nature be allowed to take its course sometime in the future, long after the program is over? Will compacted shale deteriorate in the gradual manner of the original shale, or at some indeterminate, accelerated rate, because it isn't the original shale and it has been tampered with? No one can say, because no long term studies have been made.

I am disturbed by the thought that we may be leaving a problem to our grandchildren similar to that in Appalachia, where an abandoned earth dam collapsed disastrously.

Now, Volume I of the statement was quite reassuring as to the stability of the gentle, 18° slopes of compacted shale placed in assorted box canyons. However, tucked back in Volume III was a discussion of piping slurry over the edge of Cathedral Bluffs, which have a slope of 60° or so, and that is not reassuring! You know, back East the Cathedral Bluffs would be set aside as a park or National Monument; here we have them nominated as a dumping ground! It makes me wonder about a sense of values that judges a scenic treasure on the basis of being a solution to an engineering problem! I told you that I didn't think like an engineer! I'm not too enthused about the 'solution' to the problem of growing grass and shrubs on the spent shale. We tried to get a close look at some of the test plots

last summer on some of our rockhounding trips but, as we weren't 'official', couldn't get in. But from a distance the results weren't too great plus they were certainly throwing on a lot of water. There also seemed to be some sort of mesh under the growth which would certainly add up in expenses over a large area. The only thing that looked good was the cheat-grass which is horrid stuff, has little nourishment and can really cut up a horses mouth except for a few weeks in the spring, which is about the length of time it is green also. Now I'll grant the stuff is tenacious and could hold the slopes but it isn't pretty nor good forage for anything. If more time were given to the development of a really good ground cover that would hold slopes, be good fodder, and wouldn't take super-human efforts to get started, why this spin-off would pay for half the program and be of great benefit to the west.

You see, I have great faith and admiration for the creative and imaginative areas of our technology. Some how we need the impetus of some large project, like the space program, or oil shale development, to concentrate upon but which, along the way, present various problems for solution. These solutions, in turn, have had a great benefit to everyone--new products, miniaturization applied to many fields, sophisticated computerization etc. In solving a big problem, many lesser solutions are required and can be applied to areas in which we didn't realize there was a problem until the solution was presented. It's an interesting process, and should be given a chance to function.

The Impact Statemnt recognized that there would be many environmental problems but didn't really answer many of them. There must be acceptable solutions to these problems before the program can continue.

  
Mrs. John C. Foster, Jr.

13995 W. 21st

Golden, Colo. 80401

LETTER NO. 116  
1535 Hanover,  
Aurora, Colo.,  
Oct, 19, 1972

Mr. James M. Day:  
Dear Sir:

Re: Oil Shale Devel.

Yes it belongs to the people  
(U.S. Reserves) 98% want to  
see it developed. The minority  
or other 2% are misinformed,  
about mining Oil shale. Such  
as game & wild life, Environment  
Groups, and ect.

I have made a study of  
this Oil shale Development, for  
thirty years. The 40,000 deer head  
that some say will be reduced,  
will probably double in number  
in ten years or less. I refer  
you to (Tosco) or Colony's four  
Companies joint venture, on Paracute  
Creek. The picture in Oil Shale's  
annual report, a couple years ago.  
This shows around the spent  
shale, the lush grass or vegetation

very green, and looked to be well over a foot high. This spent shale is a fertilizer, as well as has dozens, and dozens of other uses. So will of course increase the deer herds, as more feed will be provided. A lot more.

On the air pollution, this will be no problem, as the filters from the refinery's, will take care of the dust and smoke. This will be confined, to very small area around the plant. The waste water, that gets back into the streams, such as the Colo. River. This will cause no problem, it should not hurt the fish. If they are to make (protein) Vitamins &c. to help feed the world, why worry about damaging the fish.



yes there will be dozens of pick-ups and trucks on weekends, trying to get into these tailings piles, to get this spent shale for fertilizer, for lawns, garden, flowers and ect.

It will make this brief, this shale deluement is coming 20 or 30 years too late. Those that are against, are misinformed. We will be in this country, in bad shape before, the first barrel of shale oil, is produced. They will be rationing gas by 1974, so what is the hold up? So let's get this going now not next year, but 1972.

P.S. Yes these Vitamins, will help women keep off weight (shale V's that is), as was brough out in Germany meeting, a few years ago.

(over)

Yours truly,  
H. Allen George  
80010

OFFICE OF  
OCT 24 1972 (33)  
HEARINGS & APPEALS

LETTER NO. 117

GEORGE E. GLESS  
2940 THIRTEENTH STREET  
BOULDER, COLORADO 80302

October 21, 1972

Mr. James M. Day  
Director of Office of Hearing & Appeal  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Va. 22203

OFFICE OF

OCT 24 1972 (55)

HEARINGS & APPEALS

Dear Mr. Day:

I would like to have this letter included in the oil shale hearing record. I am very concerned at the high cost of oil shale conversion to crude oil both in terms of dollars & the environment. The cost is so high that even the oil company are not too keen about it.

My greatest concerns for the environment are the huge amounts of waste produced and the loss of precious water. A million and a half barrels of oil<sup>produced</sup> would mean over a million tons of waste rock to be

filed somewhere. The water lost by destroying watersheds & being used in oil production would make even more difficult our task of meeting water commitments to Mexico & others.

I would suggest that the money would much better be spent on developing means of obtaining clean burning fuel from our enormous supplies of low grade coal and finding ways to heat & cool our homes and generate electric power from our primary source of energy, the sun.

Sincerely,

George E. Glass

1045 Arapahoe  
Boulder, Colorado 80302  
October 19, 1972

James M. Day  
Director of Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

This letter is written to protest the proposed oil shale development project in Colorado. Extraction of the oil will yield only 35 gallons of oil per ton of rock and the waste piles resulting from this extraction will be of a far more vast and offensive consequence. If oil shale extraction were to be planned in your backyard or in Arlington, I would fight against it just as hard as I am here in Colorado. Think of the meager (4% of the national requirement) supply that will result from scarring and scouring what still remains as some of America's last natural wilderness. It's been millions of years in the making, and your short-lived project proposed to be a "stop-gap" measure until atomic energy is in large use, sometime around 1985, will in those few years wreck what nature has taken so much longer to give us.

Please do all that you can to prevent the oil shale project from taking place. It's your country as well as mine to preserve for our future; we can't replace it.

Sincerely yours,

*Sally J. Goddard*

Sally J. Goddard

OFFICE OF  
OCT 24 1972 (34)  
HEARINGS & APPEALS

# LETTER NO. 120

October 16, 1972  
Allison Hall #261  
Fort Collins, Colorado  
80521

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

OFFICE OF

OCT 19 1972 (37)

## HEARINGS & APPEALS

Dear Sir:

I am very concerned about the plans for oil shale development in Western Colorado. I think that more studies of the environmental impact of the project should be made before the project is launched. I am studying here in Fort Collins, but my permanent home is in Rifle, Colorado which is directly southeast of the Piceance Basin and therefore I know the problems that could be caused if proper precautions are not taken.

I don't feel that the plans made for disposal of the processed shale are going to be good for the environment. To dump 52,000 tons of shale a day into the area's canyons and expect it to not have an effect on the environment is expecting too much. Revegetation would not be guaranteed because of the high salt content and the low phosphorus and nitrogen contents of the processed shale. Also, in order to insure that the area's wildlife would not be effected adversely, the revegetation would have to be native to the area and in the same proportions as before the project. I also question the practicality and the ecological impact of bringing water for the project from the system of waterways in the White River National Forest.

I am not altogether against progress, but to forfeit and destroy our environment for progress that we may not need does

not appeal to my sense of practicality. Please don't authorize the project until more research has been done on the environmental impact of it. We have to look ahead to the future and do things in ways that are profitable for all of the people in the United States and not just for the large oil companies.

Thank you for your time and, I hope, your consideration.

Sincerely,

Pamela Sue Graham

830 - 20th St., #B-1  
Boulder, Colorado 80302

November 4, 1972

Rogers C. B. Morton  
U. S. Department of the Interior  
Washington D. C. 20240

Dear Sir:

The development of an oil-shale industry in the Piceance Basin represents a stop-gap measure. I am opposed to it.

What is needed to solve the "energy crisis" is new technology for new energy sources, not more oil.

The term "energy crisis" describes two major aspects of energy in our essentially petroleum oriented economy:

a) Our rate of oil consumption is increasing--our oil needs are infinite.

b) Our oil reserves are finite.

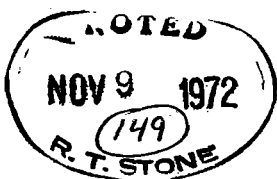
When it is clear that our oil reserves will be used up at a predictable future date, then it becomes evident that continuing our civilization as we know it demands the development of technology to provide us with new fuels.

There are several reasons for developing those new resources before the oil reserves are depleted. Smog (from oil-burning processes) should be curbed as soon as possible. Developing the technology now for using new energy sources will avoid some of the pitfalls of a crash program. Having some oil reserves with which to "prime" the new-fuel economy argues for a smoother transition to that economy.

Mining limited fuels for unlimited energy needs represents a stop-gap policy. I expect our government to support better policies--long-range ones.

Sincerely yours,

*Evelyn Gray*  
Evelyn M. Gray





Reference No.

64. Marathon Oil Company, G. R. Schoonmaker, Vice President,  
Exploration, Finlay, Ohio 45840
65. Mesa Petroleum Company, J. O. Upchurch, Vice President,  
P.O. Box 2009, Amarillo, Texas 79105
66. Offshore Operators Committee, Austin W. Lewis, Attorney,  
Liskow & Lewis, 225 Baronne Street, New Orleans,  
Louisiana 70112
67. The Oil Shale Corporation, John A. Whitcombe, Senior Vice  
President, 1600 Broadway, Denver, Colorado 80202
68. Phelps Dodge Company, Warren E. Fenzi, Executive Vice President,  
300 Park Avenue, New York, New York 10022
69. Rocky Mountain Oil and Gas Association, Warren J. Hancock,  
President, Box 1555, Billings, Montana 59103
70. Shell Development Company, Thomas Baron, President, P.O. Box  
2463, Houston, Texas 77001
71. Signal Oil and Gas Company, W.H. Thompson, Jr., 2800 North  
Loop West, Houston, Texas 77018
72. Sohio Petroleum Company, H. Pforzheimer, Vice President, Midland  
Building, Cleveland, Ohio 44115
73. Sun Oil Company, Fred M. Mayes, Vice President Development  
Projects, P.O. Box 2880, Dallas, Texas 75221
74. The Superior Oil Company, B. E. Weichman, P.O. Box 1521,  
Houston, Texas 77001
75. Utah Resources International, Inc., John H. Morgan, Jr.,  
President, 709 Walker Bank Building, Salt Lake City,  
Utah 84111
76. Harrington, D. D., 701 First National Bank Building,  
Amarillo, Texas 79101. (For unidentified Company  
in U.S. Oil Shale Company Group).

Reference No.

51. Utah Audubon Society, Arabelle McDonald, 611 South 1st East, Brigham City, Utah 84302
52. The Wilderness Society, Clifton R. Merritt, Director of Field Services, 4260 E. Evans Avenue, Denver, Colorado 80222

5. Private Industry

53. Amarillo Oil Company, E. S. Morris, President, Suite 800, Plaza One, P.O. Box 151, Amarillo, Texas 79105
54. American Petrofina, Inc., John R. Moran, Jr., Moran, Reidy, & Voorhees, Attorneys, 818 Patterson Building, Denver, Colorado 80202
55. APCO Oil Corporation, H. F. Boles, Vice President, Exploration and Minerals, 17th Floor Houston National Gas Building, Houston, Texas 77002
56. Bell Petroleum Company, Holland and Hart, Attorneys, 500 Equitable Building, 730 Seventeenth Street, Denver, Colorado 80202
57. Cameron Engineers, Russell J. Cameron, President, 1315 Clarkson Street, Denver, Colorado 80210
58. Colony Development Operation, John S. Hutchins, Manager, 1500 Security Life Building, Denver, Colorado 80202
59. Development Engineering, Inc., John B. Jones, Jr., President, 1827 Grant Street, Denver, Colorado 80203
60. Diamond Shamrock Oil and Gas Company, Avery Rush, Jr., President, P.O. Box 631, Amarillo, Texas 79105
61. Geokinetics, Inc., Mitchell A. Lekas, President, Suite 300, 1875 Willow Pass Road, Concord, California 94520
62. Humble Oil & Refining Company, C. S. Fleischmann, Manager, P.O. Box 2180, Houston, Texas 77001
63. Koch Exploration Company, R. T. Bick, President, Box 2256, Wichita, Kansas 67201

October 31, 1972

LETTER NO. 122

Dear Sir;

NOTED  
NOV 9 1972

I would like to voice my dissatisfaction with the plans regarding the Oil Shale Project in western Colorado. I am strongly opposed to the plans to dam a portion of the south fork of the White River which is in Wilderness land. I would also like to encourage a more thorough investigation of the secondary effects, such as the large increase of population on the area. I feel that very tight control by the gov't is necessary to ensure that the project is in the public's best interests, rather than that of private industry.

Sincerely yours,  
Timothy K. Green  
8307 Ames Way  
Arvada, Colorado  
80003

OFFICE OF

NOV 6 1972

HEARINGS & APPEALS

Oct. 20, 1972

Mr. James M. Day,

Dear Sir,

I'm a concerned citizen of Beckenridge Colo. informing you of my views on the Oil shale development of our country. Please include this letter in the Oil shale hearing record.

We must not destroy any portions of our country for a product that in less than 15 years will be out dated with our advanced Atomic Energy Power. We must rely on our land should be saved for the future use of all, not destroyed for a gain that in 15 years is no longer useful. We must be concerned with ~~future~~ future and advancement

EST of our Country We must  
advance without the needless  
destruction of our lands. Let  
our actions be something the  
whole world will respect.

Thank - you.  
Robin W. Gustafson

HEARINGS & APPEALS

OCT 24 1972 (57)

OFFICE OF

LETTER NO. 124

Jay S. Haley  
Boulder Colorado  
October 24, 1972

James M. Day

Director: Office of Hearings and Appeals

Dept of Interior  
4015 Wilson Blvd  
Arlington Va.

Mr Day,

I am writing in protest of the Interior Department's plan to lease over 10,000 acres of Colorado public land to private concerns for the purpose of oil shale development. Such a project would have major environmental implications, many of which, I understand, have not yet been studied. As a Colorado citizen, I urge you to reconsider this matter in the light of our growing need for a healthy environment. Perhaps a serious mistake can be averted.

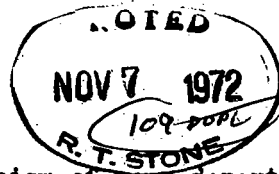
Sincerely,

Jay S. Haley

# LETTER NO. 125

November 1, 1972  
310 Peterson St.  
Fort Collins, Colo.  
80521

Honorable Rogers C. B. Morton  
Secretary of the Department of the Interior  
Department of the Interior  
Washington, D. C.



Dear Secretary Morton,

In light of the recent criticism of your department's oil shale leasing program by state agencies, private citizens, conservation groups and sections of the oil industry itself; I feel it is imperative that you carefully reconsider your plans for development. Testimony presented at the public hearings in Denver on October 10, 1972 pointed out many of the problem areas where your program planning is inadequate, and the consensus seems clear to me-- Oil shale prototype development as outlined in the Draft Environmental Statement should not be allowed to proceed.

One of the factors that makes your department's environmental planning appear so inadequate is the comparison between your work and the private efforts made by Colony Development Corporation at their Parachute Creek operation. It seems ironic that a private corporation is providing better environmental protection for their private holdings than the U. S. Government is providing for public lands. I am sure that you are well aware of Colony's efforts, so I will refrain from a detailed comparison.

I bring up the subject of Colony's environmental planning because I would like to propose to you a bold compromise. It seems to me that your department could fulfill most of its objectives as set forth in the Draft Environmental Statement, and at the same time avoid profound extensive environmental damage to public lands, by supporting this private venture and shelving your leasing program.

This would bring about a true prototype development: not a massive 50,000 acre-6 site crash industry, but a limited, controlled, monitored single operation on private land. By working with Colony, much could be learned about production techniques, mining safety, economics, air pollution potential, reaction of wildlife, revegetation success, water demands etc. without causing extensive degradation of the regional environment.

Six separate operations is not a prototype development in any sense or the word. It is a crash attempt at a commercial industry and a misuse of our public lands. As a private citizen, I would like to see private industries proving the viability and safety of oil shale development on their own land before we lease public lands to them. Colony Development Corporation is willing to accept this challenge. I think we should let them take the lead, and let us learn from their experience, instead of experimenting without proper planning and prior knowledge.

I do not know if Colony would be interested in gaining Government backing in exchange for sharing information, but I do believe that they should be approached and that this policy should be pursued rigorously. At this time, I feel that the policy outlined above, or the alternative of no development at all, are the only sane and justifiable policies for our public oil shale lands.

Thank you for your attention. I would appreciate hearing from you on this matter.

Sincerely,

*Bruce Halliday Hamilton*

Bruce Halliday Hamilton

cc: Reid Stone, D. of I.  
Paul Kilburn, Colony  
Carolyn Johnson, COSC  
James Day, D. of I.  
Gov. John Love, State of Colo.



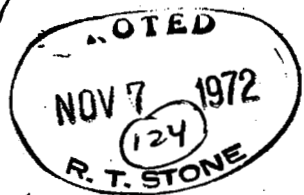
Dear Sirs:

I am writing to express deep concern about the "crash" program to develop oil shale reserves. Our public lands should not be developed without careful study as to the effects it will have on the environment. Irreversible damage could be done to our non-renewable resources.

The Piceance Basin is not a wasteland that can accept any insult; but a delicate natural system whose natural treasures can be appreciated. Please don't make hasty decisions about this matter without more environmental data!

OFFICE OF  
NOV 3 1972

Sincerely,  
Kay Harber



LETTER NO. 127

Aspen Colo

Nov. 6, 1972

OFFICE OF

NOV 9 1972

HEARINGS & APPEALS

U.S. Dept of Interior  
Office of Hearings & Appeals.  
4015 Wilson Blvd.  
Arlington, Va 22203



Gentlemen:

Re: proposed nuclear oil shale blasting in Western Colorado.

Last month in Grand Junction, Colo. hearings on the Interior Dept's Environmental impact Study of this project were held.

As a citizen of western Colo (Aspen), I'd like to add my voice to those who believe the study contained insufficient and self-contradictory information about the Environmental impact. I'm also opposed to any further nuclear testing, as in the Rubicon Project.

Reasons for differing with the report

- 1) Lack of communication between Dept of Interior and State of Colo
- 2) Salinity increase not sufficiently tested
- 3) No statement re: air pollution <sup>now</sup> ~~not~~ capacity of area to support population boom.
- 4) Damage, permanently to flora & fauna, esp of large deer populations
- 5) Threat to already diminished western slope water

b.) Proposed use of public land, rather than private,  
for an oil shale industry, speculation of uncertain results.

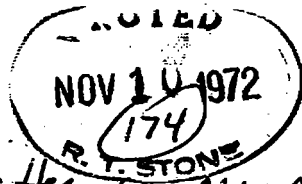
Please continue to leave the line of  
communication open + study this proposal  
further.

127

Sincerely,  
Karen Hemen

Oil Shale  
Rm 7000  
11-3-72  
LETTER NO. 128

Dear Sir:



This letter concerns oil shale development in Colo., Wyoming, & Utah. I realize the need for oil, but am also concerned because I've seen the strip mined coal country in the East. All that we ask is your consideration of the rivers, canyons, and vegetation of these regions so that both animals & people can enjoy it for years to come. I'm willing to pay for a protected environment, by higher oil prices.

Thank you,  
Duncan & Carol Himes

# LETTER NO. 129

October 20, 1972

James M. Day

Director of the Office Of Hearings and Appeals  
Department of the Interior

Dear Sir:

The planned action of the Arco Oil Company to develop areas in the Colorado region for oil shale exploitation should be abandoned until further research on alternative sources are found.

Having been a Colorado resident for many years, I feel a certain attachment to the natural beauty located here. This natural beauty is becoming an increasingly rare commodity, as spasmodic and uncontrolled growth become more evident. The wilderness benefits all, and is important to the future generations of time.

Energy is of prime importance to us all. Without it, technology could not have carried civilization to the point where we now stand; advanced enough to enjoy forests and wildlife without having to break our backs raising food. However, the exploitation of oil shale in Colorado offers a very limited source of energy in relation to the impact on the environment of the state.

The massive tailings, the vast water requirements, and the lack of knowledge on environmental impact, could do untold damage to the state and its people.

It is time for technology and the government to work to find alternative energy sources, that would have a higher return but cause less damage.

I implore you to examine the facts, and I trust that you and your department will make a decision for the betterment of all. I request that you include this letter in the hearing record.

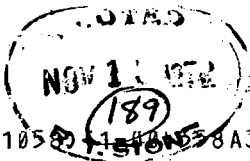
OFFICE OF

OCT 25 1972 (44)

Sincerely,

Robert N. Hotchkiss  
Robert Hotchkiss

LETTER NO. 130



OFFICIAL USE ONLY

NOV 1 1972

ST. MARY'S J. CO.

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11 COLORADO OIL SHALE DEVELOPMENT PROGRAM IS INADEQUATE  
12 AND SHOULD BE GIVEN MORE TIME AND ANALYSIS  
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OFFICE OF THE SECRETARY  
DEPT. OF THE INTERIOR  
WASHINGTON, D.C. 20240

NOV. 1, 1972  
LETTER NO. 131

DEAR SIRs:

I WOULD LIKE TO TAKE THIS OPPORTUNITY TO EXPRESS MY OPPOSITION TO THE PROPOSED OIL SHALE DEVELOPEMENT PROJECT IN COLORADO, WYOMING, & UTAH. OF PARTICULAR CONCERN IS THE PICEANCE CREEK BASIN OF WESTERN COLORADO WHICH IS ONE OF THE LARGEST NESTING AND WINTERING AREAS FOR GOLDEN AND BALD ENGLES IN THE U.S. I FEAR THAT THE OIL SHALE DEVELOPEMENT WILL PRODUCE SUFFICIENT ENVIRONMENTAL DEGRADATION TO UPSET THE FRAGILE ECO-SYSTEM OF THIS AREA.



SINCERELY,  
GARY HLETT  
230 N. 11<sup>TH</sup> AVE  
BRIGHTON, COLO. 80601

24 October, 1972

LETTER NO. 134

James M. Day  
Director of Office of Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Virginia

Dear Sir:

It has come to my attention that the Interior Department has plans to lease approximately 10,000 acres of public land in northwestern Colorado for oil shale development. As a citizen of the state of Colorado I wish to voice a strong protest ~~and~~ against such action on the basis of the inevitable damage to the Colorado River drainage as well as the general ecological and economical imbalance imminent in such a plan. No action whatsoever should be taken to develop the oil shale resource until lengthy, quantitative reports from the EPA can be made, studying the ecological impact of wide scale strip mining in northwestern Colorado.

Sincerely,

Michael L. Japhet  
1044 Pleasant St.  
Boulder, Colorado

OFFICE OF

OCT 27 1972 (76)

HEARINGS & APPEALS



OFFICE OF  
OCT 24 1972 (42)  
HEARINGS & APPEALS

1203 Third Avenue  
Longmont, Colorado 80501  
October 20, 1972

Mr. James M. Day  
Director of Office of Hearings and Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

I wish to register my protest regarding the proposed oil shale development project enacted by the Department of the Interior. Our very naive Governor Love stated that "he hasn't any reason to believe oil shale development will be carried out in an environmentally unacceptable manner." This does not reflect the thinking of the people of this state, as far as I am concerned.

The project is totally unacceptable for the following reasons:

1. Tailings from the operation will fill several canyons to a depth of 800 to 1000 feet. The tailings from 8 months of oil production will be the same as the total amount of waste produced by the Climax mine since its beginning. The tailings are black (absorb heat), small particles (produce dust storms), contain salts (increase salinity of the Colorado River 1.5%), and hygroscopic (holds water) thereby creating a sterile environment. Imagine the huge canyons of the west slope filled with sterile black sludge. It is not a pretty picture.
2. The project will need large amounts of water, to supply water needs there are seven new dams to be built, plus water transfer projects. These secondary projects have not been studied for their impact on the area.
3. The project will cover 10,000 acres of land, and there is the potential of increasing this to 20,000 acres.
4. The population will increase from 30,000 people to 50,000 in the Rifle area within a nine year period. This has not been studied in the impact statement.
5. To supply electricity for the project, several power plants will be built. These will be comparable in size to the large installation in the Four Corners area. The impact of these have not been studied.
6. The increase in air pollution has not been quantified. The impact study admits to large increases of air pollution, but there are no figures available.

7. This development will be three times larger than any mining project in history.

As if these weren't reasons enough, I have still further reasons. These are:

- A. The best deposits of oil shale are on private land. It isn't being developed because the oil industry fears it won't be profit making.
- B. To urge the oil companies to start production, the government is willing to lease public lands with shale at 50¢ per acre. This is compared with 2000 to 5000 dollars an acre for comparable private land.
- C. Oil shale oil costs at least twice as much as regular oil production costs.
- D. From one ton of rock comes only 35 gallons of oil in the Colorado deposits. The Wyoming and Utah deposits are so poor that the oil companies have said that they prefer to see only Colorado ripped up.
- E. The impact statement admits that this is a stop-gap measure until atomic energy is in large use. This should be around 1985. At peak production, oil shale can only produce 4% of the oil in the U.S. This fills only the very smallest of gaps. In fact, peak production is scheduled to take place in 1985, the same time that atomic energy will begin to cause the phasing out of this program (along with the 40,000 jobs it will create.)
- F. Kenneth Garfield of Arco Oil Company says "oil shale can't be commercialized without an effect on the environment." There is considerable doubt whether it can be commercialized at all. After spending 2.8 million dollars into their own oil shale project, Equity Oil reports that they fail to believe it can be feasible at all.
- G. Reaction at the hearings, to quote the Denver Post was "Praise for the statement . . . was perfunctory and scant." Citizens, environmental groups, and even oil companies, had many criticisms of the statement.

It is my belief that the price that Colorado (and the citizens of Colorado) will pay for a meagre supply of oil which will be phased out in a matter of approximately 10 to 13 years, is much too dear. We will not pay that price. Alternate sources of energy must be found to supplant the meagre supply of oil that will be gained from oil shale.

Please include this letter in the oil shale hearing record.

Thank you.

Sincerely,



(Mrs.) Esther B. Jurgens

LETTER NO. 137  
OFFICE OF  
OCT 24 1972 (40)

HEARINGS & APPEALS

October 12, 1972

James M. Day  
Director of Office of  
Hearings and Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Day:

As a resident of Colorado, I am very much interested in the outcome of the proposal to lease land to energy companies for the recovery of oil shale in Western Colorado.

Regarding the Environmental Statement prepared by the Interior Department, it is my understanding:

- Existing air quality and atmospheric conditions at the sites haven't been monitored and neither industry nor citizens will know whether air pollution regulations can be met.
- There is confusion whether there will be a salinity increase in the Colorado River, and the debate is not addressed.
- Mine safety is glossed over. General safety provisions for the workers and responsibility questions are unanswered.
- Water use by increasing populations in the areas isn't addressed. There is only speculation about where water will come from for industrial operations. Alternatives must be spelled out.
- Environmental impacts from water development aren't discussed. Power plants are mentioned in connection with an oil shale industry, but their impacts aren't considered.
- Social impacts and specific urban land use patterns and controls aren't addressed.
- There is an inadequate study of revegetation, with no provisions to monitor the success or lack of success of the revegetation program.

It seems imperative that all foreseeable impacts be studied before a decision is made on the oil shale leasing program. With the information I have as a citizen, I oppose the project and await further information.

Sincerely,

*Rod Kuharich*  
848 — 17th St  
Boulder, Colo. 80302

LETTER NO. 138

1634 Walnut St.  
Boulder, Colorado  
80302

November 8, 1972



Office of the Secretary  
U.S. Department of the Interior  
Washington, D.C.

### To Whom it May Concern:

I understand that this letter will be passed the deadline for mail received concerning the extraction of oil from shale in the three corners area of Colorado, Utah, and Wyoming. However, I would like to express my opposition to any development of this area, expressly that of oil shale.

The delicate ecological balance of this area is my prime concern. It is wild and semi-wild. For this area to undergo the development connected with oil shale extraction would place an undue strain on the lives of many species of animals and wild life also the water ways through this area. The disposal of wastes from extraction, the necessary roads, and personnel influx would damage the wild ~~savanna~~ sanctuary.

As I understand it there has been no comprehensive analysis of the wild species which inhabit this area nor any specific provisions for protection of them. The bald eagle, the golden eagle, and the peregrine ~~eagle~~ falcon are found in the three-corners area. All are considered rare, threatened, and endangered. The mountain lion is in a similar category.

We need to restrain from introducing large commercial developments in wild areas, thus preserving in some areas a natural habitat for those creatures who share this land.

I am strongly opposed to the development of oil shale production in this area. Oftentimes the hand of man is devastating.

Sincerely,  
Steven & Nancy Kinghorn

LETTER NO. 139

R.T. 3, Box 76

Cheney, Wash.

99004

11/2/72



Mr. James M. Day

Director of the Office of Hearings and Appeals  
Dept. of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Dear Mr. Day,

Please include these comments in the final impact statement dealing with the oil shale lands in the Rocky Mountains. The magnitude of the project could involve considerable land area and environmental costs. The leasing program should be delayed until more answers are available on the environmental problems. An environmental study of the areas to be affected should be made prior to granting of leases.

OFFICE OF  
NOV 10 1972

Sincerely yours,  
Eugene Kiver  
EUGENE KIVER

LETTER NO. 140

WASHINGTON STATE UNIVERSITY  
PULLMAN, WASHINGTON 99163

DEPARTMENT OF ANTHROPOLOGY  
Office: (509) 438-4366

LABORATORY OF ANTHROPOLOGY  
Office: (509) 335-8356

October 18, 1972 OFFICE OF

Director of the Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, VA 22203

OCT 24 1972 (35)

HEARINGS & APPEALS

Dear sir:

I was more than disturbed to receive a Department of the Interior news release dated October 10th, on October 17th--- notifying me of oil shale hearings in Denver, Cheyenne and Salt Lake City on October 10-13. This appears to be a deliberate attempt to keep individuals concerned with the environmental impact of proposed oil shale exploitation from expressing their concern and affecting the outcome of the hearings. I strongly protest such maneuvers.

This is the second such incident related to the oil shale hearings. On September 21st I received another news release, this time dated September 7th, notifying me that a draft environmental impact statement related to initial oil shale leases had been released that day, and that I (and others) had 45 days in which to appeal the report. Since there were no copies immediately available to anyone not in a limited number of cities, it took me until October 13th to obtain copies of the archeological evaluation I was concerned about. That made it a little bit difficult to attend the hearings, even if I could have gotten to Salt Lake City, and without a lot of help from other concerned people, I wouldn't have found a copy at all. I would add that when I called fellow archeologists in Colorado, supposedly in direct contact with the Department of the Interior and responsible for proposed archeological survey during the coming summer, they had received no notification of the release of the draft statement. In other words, it was only chance and luck that I was able to find out about the Statement, notify other individuals to check the release for the archeological evaluation, and try and salvage some of our prehistoric heritage. It appears to be a deliberate attempt to allow the mining interests to work without interference from efforts to preserve some of our natural or cultural heritage.

When I finally did get a copy of the draft statement, I was disturbed to see that no attempt had been made to carry out professional archeological survey of the proposed areas. A statement that no sites have been reported in the literature in the past is negative evidence that archeological or historical remains are

WASHINGTON STATE UNIVERSITY  
PULLMAN, WASHINGTON 99163

140

DEPARTMENT OF ANTHROPOLOGY  
Office: (509) 335-8556

LABORATORY OF ANTHROPOLOGY  
Office: (509) 335-8556

page 2

indeed present in the proposed lease areas---the comment that strip mining has positive value in that it exposes hitherto-unknown sites (while destroying them) is too ridiculous to require much comment. Shouldn't an environmental impact statement be more responsible than this?

I understand via the grapevine that a request for archeological survey before a final impact statement is accepted was put forth at the Denver hearing on October 10th; if it was not, I would like to make that request briefly here. Of course nothing has been found if no one has looked for it.

If your office has any responsibility for seeing that notices of hearings are sent out, I would appreciate it if you could insure that they arrived in sufficient time for concerned individuals to prepare a case and attend. My mail came directly to me, with no hitches at the post office, but was far from being in time.

Sincerely,

*Ruthann Knudson*

Ruthann Knudson

Ph.D. Candidate in Anthropology

Editor, Newsletter of Lithic Technology

cc: Senator George  
McGovern

LETTER NO. 142

DANIEL LOWENSTEIN  
302 ARNET HALL  
UNIVERSITY OF COLORADO  
BOULDER, COLORADO 80302

October 18, 1972

James M. Day  
Director of Office of  
Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Virginia, 22203

OFFICE OF

OCT 24 1972 (62)

HEARINGS & APPEALS

Dear Sir,

I wish this letter to go on record as opposition to the Interior Department's plan to lease Colorado land to private companies for oil shale development.

My reason for opposition entails the belief that such use of land will result in a huge destruction of Colorado's natural environment. The basis for this belief includes:

1. Dams and powerplants will be constructed on the White and Colorado Rivers; yet there has been no impact study on any of these secondary projects.
2. Recycled water will vastly increase salinity; as it is doubtful whether the companies can completely purify the returns.
3. Tailings from the project will completely fill some canyons of 800-1000 feet in depth.

I am begging the Interior Department to reconsider this plan. There has not been enough impact studies into the total scope of the projects.

Please preserve the beauty and purity of our wonderful lands!

Sincerely yours,

*Daniel A. Lowenstein*



LETTER NO. 143  
Oct. 25, 1972  
152 Arnett Hall  
Boulder, Colorado  
80302

OFFICE

OCT 30 1972 (8)

Mr. James M. Day  
Director of Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Virginia 22203

Dear Mr. Day:

As a resident of Colorado, as well as a student at the University of Colorado, I am writing to state my feelings against the proposed oil shale development in Western Colorado. I believe that the damage to the environment the industry will bring far outweighs the benefit of additional oil.

One aspect of pollution that especially alarms me is the water resource required. The Colorado River is known for its salinity even today. I don't think that anyone can deny the fact that oil shale development will add to this already major problem. This, along with damming, I believe will destroy much of the recreation the rivers now offer. I am also against any dams ~~be~~ threatening any body of water in the Flattops Primitive Area.

These problems the oil shale will bring, along with the disturbance of the Rulison Project, and the well-

known air pollution of the four-corners area, make it appear that Washington has no thought for what they may do to an area. I think it is time to relieve the Colorado-Utah area of some of the illth that government projects bring.

For these reasons I would like to state that I am very much against oil shale development in Western Colorado. Thank you.

143

Sincerely,  
Dan Lowery

Director of Hearings & Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia

OFFICE OF  
OCT 24 1972 (24)  
HEARINGS & APPEALS

Dear Sir,

I am writing to express my deep concern for the areas of western Colorado which have been sighted as prospects for oil shale development. I feel there has not been enough study to prove that this development can proceed without bringing tremendous harm to the wildlife, plant life and aesthetics of the Piceance Basin. To allow this development to proceed without intensive research would be a disaster. The balance of nature is delicate and man could not "undo" what he has ruined. Please help delay approving the oil shale project until there is further study into the project's effects on this beautiful area of Colorado.

Sincerely,

Richard J. Lubchenas  
901 W. Mountain Avenue  
Ft. Collins, Colorado 80521 -

October 20, 72

144

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia

Dear Sir:

I am very concerned about the prospect of oil shale development in Western Colorado. This area is irreplaceable to man as well as to the many animals who live there. The problems of water & refuse as well as the affects on animals of the Piceance Basin need to be studied much more thoroughly before the development of oil shale is even considered. I urge you to ensure the protection of this beautiful area by not allowing oil shale development to begin until we can be positive of all the affects.

Thank you

Sincerely,

Mrs. Harriet Lullhenn  
901 W. Mountain  
St. Collins, Colorado 80321

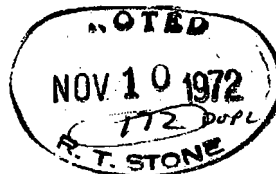
OFFICE OF

OCT 24 1972 (63)

HEARINGS & APPEALS

David McCargo Jr.  
3300 So. Washington St.  
Englewood, Colo. 80110  
2 November 1972

Mr. James M. Day, Director  
Office of Hearings & Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203



Dear Sir,

During the oil shale hearings that were conducted at the Denver Federal Center on the 10th and 11th of October, substantial oral testimony was given opposing the proposed Federal Oil Shale Leasing Program. The opposing testimony, which I generally concur with, focused on three arguments. First, oil shale development will do little or nothing to alleviate a national energy crisis. Second, the proposed leasing program unfairly subsidizes oil shale development. Third, the Draft Environmental Impact Statement leaves unanswered numerous important environmental questions.

1) Large-scale oil shale development will signal the last stages of a national fossil fuel shortage. This is considering commercial feasibility and related environmental problems. Even the Draft Environmental Impact Statement admits that oil shale development will only temporarily satisfy a small part of the projected demand for petroleum and related products. The only long range solution that there appears to be is to stabilize demand, at least until more efficient and environmentally acceptable energy sources are found. Before the Government and/or private industry can be permitted to undertake such a hazardous experiment, the entire national energy problem will have to be resolved first.

2) The proposed leasing program would subsidize commercial oil shale development at the public's expense. This is nothing new since the U.S. Government has long subsidized the petroleum industry in a variety of ways. The oil shale industry claims that oil shale development is now commercially feasible. If this is the case, then the oil shale industry should not ask to develop public domain lands before they develop their own lands with their own monies. Beyond this, it is time that public land and tax laws be remedied to remove the special advantages that have been long extended to the resource extraction industries. Such laws should recognize the fact that our environment and diminishing resource base are being dangerously depleted. Monstrous projects such as oil shale development must be forestalled until the public can protect itself with more intelligent and farsighted legislation.

3) The mining of thirty thousand acres as proposed in the initial oil shale leasing program, not to mention twenty thousand square miles, is a nightmarish prospect. First, the Draft Environmental Impact Statement hardly begins to deal with what is at issue. How is the national energy crisis going to be resolved? What secondary facilities will be required and who will subsidize them? How will effective regional planning be accomplished? Where will the water come from and what will be done with it? These are just a few of the questions that remain unanswered. Second, there are some glaring inadequacies in the recommended reclamation administration and enforcement procedures. For example, the lessee is by and large independent to monitor his own operations to include the establishment of his own reclamation standards. There are few stipulations to have mining operators bear the full costs of water, electricity, road building, and reclamation which are typically passed on to the taxpayer, at least in part. The language outlining the regulatory responsibilities of Government supervisory bodies such as the "Mining Supervisor" is too riddled with loopholes to make it acceptable. Finally, as much respect as I have for the Bureau of Land Management, how can an agency that does not even have an Organic Act effectively oversee such a large operation?

One subject that almost is ignored in the Draft Environmental Impact Statement, but which greatly interests me, is Wilderness. Not only does the Impact Statement fail to define what impact oil shale development will have on proposed wildernesses such as Flat Tops, Blue Mesa, and Dinosaur National Monument, but it does not even consider the possibility that increased economic development of the Western Slope will make future wilderness withdrawals almost impossible. No thought has been given to the Wilderness character of much of the Piceance Creek and Uinta Basins. Indeed, few people have ever thought about setting aside large areas in this region as Wildernesses probably because it is infrequently visited and does not outwardly compare with more scenic and better known areas. However, just as we are beginning to acknowledge the importance of preserving deserts, prairies, and swamplands, perhaps we ought to begin thinking about preserving some of the upper sonoran, high plateau country. The Book Cliffs, Cathedral Bluffs, and the geological formations of the lower White River Drainage are unique and impressive in their own right. There are few such places left in the continental United States where one can still feel a sense of vastness. Open pit and/or contour mining undoubtably would be used to exploit much of this region. Because of the nature of the terrain, this area could never be restored to its original character once it had been mined for oil shale. One government official privately commented to me that he felt that some of these few remaining vast areas should be preserved for no other reason than they could never be adequately restored. It might be well for us to think about this before we mine, build over, or dam up what little is really left.

I hope that you will seriously consider my comments, and ask that you enter this letter in the official hearing record.

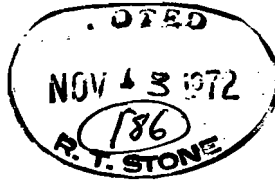
Cordially yours,

*David McCargo Jr.*

David McCargo Jr.

LETTER NO. 146

Rogers C. B. Morton  
Secretary of the Interior  
Department of the Interior  
19th and E Sts. N. W.  
Washington, D. C. 20005.



NOV 10 1972

RECEIVED

Dear Secretary Morton,

The following is a written statement I wish to have entered into the record of the recent Oil Shale Leasing hearings held in Denver recently. It is my understanding the record shall remain open until November 7, 1972 for the submittal of further comment. I ask that the text of my statement be forwarded to the proper agency and made a part of that hearing record.

Statement submitted by John L. McCormick:

The development of oil shale reserves found in Colorado, Utah and Wyoming is close at hand. The technology exists to retort the shale and refine the substance to a marketable petroleum product. Further development of the technology and refinement of the process will supposedly yield many millions of barrels of oil per day. There is no arguing the increasing demand for petroleum in this nation and there is no sign of large domestic reserves being developed other than the Prudhoe Bay fields in northern Alaska. Thus, combining the advancing technology of oil shale conversion and the increased pressure for existing reserves, it appears likely the petroleum supply industries will commence the production of synthetic oil within the next decade. Whether they achieve their goal without federal support is a speculative issue, for it is my understanding a great deal of the existing oil bearing shale is found on land managed by the Bureau of Land Management.

Leases are to be negotiated early next year between the Department of the Interior and certain petroleum companies for the purpose of opening oil shale deposits for conversion to oil by a retorting process in pilot plant operations. These pilot plants are to serve as the first practical test of the conversion method, which results will determine the feasibility of retorting on a major scale. It would seem appropriate for the Department of the Interior to sponsor further research since it has constructed and is supervising the operation of coal gasification pilot plants in various parts of the country. I encourage the study of oil shale conversion methods in a pilot plant set-up since this research will serve to advance the technology of retorting and will also point up the serious problems encountered in this industry. At least the public will have some input into the further development of the shale if the federal government is a party to the research. Perhaps it will be discovered that the cost of converting the shale is prohibitive in an economic and environmental sense.



The initial objections in regards to issuance of the leases have come from the environmentalists and deal mainly with the problems created by water consumption, strip mining of the shale and dumping of the waste materials. All of these objections are legitimate and each poses a serious problem to the surrounding land and water resources in the area proposed for leasing. A solution to the waste dumping problem seems to be non-existent, judging from the testimony supplied at the hearings. Even technicians within the Department of the Interior admit they do not have a more suitable alternative than dumping the waste into valleys and depressions in the mining and processing areas. Since the volume of the material increases after conversion, the likelihood of burying the spoil seems impossible. The mining and reclamation problems may be solved with enactment of a federal surface mining law but the techniques to comply with those regulations probably does not exist and until they do, mining of the shale may be prohibited. The water consumption aspect may also be a limiting factor since it may be determined that supply of water in the area is not adequate and augmentation of existing sources is not feasible.

While the concerns registered by the public sector are all of vital importance to the environment, I feel there was an absence of one very important viewpoint. It is my opinion that proceeding with issuance of leases of oil shale deposits for the purpose of furthering research and eventual production of synthetic oil without a National Energy Policy in effect would not be in the best interest of sound resource management. By this, I mean, conversion of oil shale into a refined gasoline to be consumed in an inefficient internal combustion engine is a gross misuse of the resource. We must look upon the oil shale reserves as a luxury resource to be tapped only as a last resort and only for a high-priority use. I do not consider powering large gasoline engines with conversion efficiencies of thirty percent or less to fit this criterion. Rather, oil as a chemical component of other substances such as plastics for building materials or synthetic fabrics should be considered as an end product of the synthetic oil. If this priority is adhered to, the development of the oil shale reserves does not become as pressing since the volume demand for oil in these industries does not match that of the gasoline industry. To sum this up I would say that it is preposterous to think that the Rocky Mountains will be strip mined and the shale deposit be converted to oil so that automobiles which are grossly overpowered and completely inefficient can carry the nation to and from the grocery store.

I realize both the House and Senate bodies are considering the enactment of a National Energy Policy. Until they do so there should be no leases granted by the Department of the Interior. While I do advocate the research of oil shale conversion, I do not want to see the oil industry given a blank check as to how they can market the final product. With all of the external costs involved in producing this

Page 3.

synthetic oil the nation must have the guarantee that it will be used not to provide further profits for the mining and processing investors but to fill a most beneficial need. Let the nation through its' congress decide these priorities through enactment of a National Energy Policy before the shale deposits are turned over to the oil interests.

John L. McCormick

11/35  
11/37  
11/42  
Interior

Pres. Nixon  
9/5-2  
Dear Sir:

pro telegram  
cause

LETTER NO. 147

Please  
further study on oil shale development  
plan for Colorado, Wyoming & Utah  
There is grave danger to flora & fauna  
of water is diverted to this purpose

NOTED  
NOV 20 1972  
R. T. STONE

Sincerely,

Mrs. J. J. McCoy  
12734 Callan Dr.  
Whittier, Ca.  
90602

OFFICE OF

OCT 24 1972 (65)

LETTER NO. 148

HEARINGS & APPEALS

1254 Penna  
Denver Colo  
Oct 17, 1972

Mr James M Day  
Director, Office of Hearings + Appeals  
Dept of Interior

Dear Sir:

I would like to register my  
opposition to the proposed oil shale  
development in the Piceance Basin  
northeast of Grand Junction, Colo.  
I think this would be disastrous.

Yours truly,  
Mrs Diane McElvain

LETTER NO. 149

85 10/24/72  
OCT 28 1972

Dear Mr. Weston  
T. STONE

I am writing to you  
concerning the enclosed article  
in Sun. paper

Isn't there some way to  
prevent this awful scarring of  
our beautiful lands? In all  
of our advanced knowledge  
it seems a shame that oil  
cannot be taken from earth  
except by ruining the mts.  
to get it! Also our area  
is a game reserve, and you  
know as well as I that  
our game cannot be run

out, that if it continues  
there will have no more  
game as well as round  
land.

I am a little disappointed  
if you allow this to happen  
and I am just a little  
bit mad at our officials  
in N. C. it seems they  
are there for their own  
welfare & not for the  
good of all of our people.  
The reason I'm writing to  
you thanks you very

P.S. Expense  
awful writing  
but I'm mad!!!  
==

3.  
Sec. of Interior, is that  
I'm always felt your  
more sincere and worked  
for our country and not  
just yourself, I do hope  
I'm not misguided in  
writing to you.

Please help our nation  
to stay beautiful & not  
let it be destroyed.

Faithfully

Red S McMillan  
103 W. 3rd St.  
North East, Ind. 21901



228 Newson Hall  
Fort Collins, Colorado  
October 31, 1972

Director of the Office of Hearing and Appeals  
Department of Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Sirs:

I am writing this letter in response to your proposed program to lease public lands containing oil shale deposits in the states of Colorado, Wyoming, and Utah. From what I have read I get the impression that you are trying to stimulate the oil shale industry. As a concerned owner of these lands, I feel that more intensified long range studies should be put into affect. I also feel that the Department of the Interior should not sign any lease contracts this December of "72" before the full impact of these studies have been completely evaluated.

According to the facts that I have read, I feel the negative aspects of developing our oil shale resources outweigh the positive ones. The air, water resources, natural topography and wildlife will suffer if full scale industry moves into this area.

I wish to be better informed about your proposed oil shale plans. The Department of Interior should prepare and publish a simple, concise summary of the Environmental Impact Statement. This summary should be made available to the public at minional or no cost. I personally do not have seven dollars to purchase the Impact Statement, nor do I have the technical background needed to understand it. I feel this problem can be elievated by preparing such a summary. This way, we, the public can be better informed of the future uses of our public lands and have adequate time to voice our opionions. I would really like to see such a summary written and distributed.

Sincerely yours,

*Mark Alan Mercer*

Mark Alan Mercer  
Concerned and intensely  
worried Coloradoan

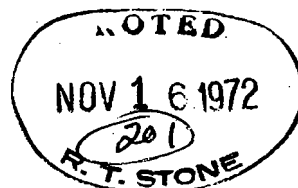
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HEARINGS & APPEALS

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*Interim*  
LETTER NO. 151

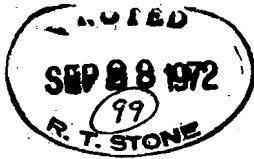
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6 PMS PRESIDENT RICHARD M NIXON  
7 WHITE HOUSE DC  
8 URGE HAULTING DEVELOPMENT PUBLIC LANDS FOR SHALE OIL WITHOUT  
9 INDEBT STUDIES LONG RANGE EXOLOGICAL IMPACT  
10 DOROTHY B, DANIEL R MERRILL HAWLEY RD1 PENNSYLVANIA 18428  
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Identical telegram sent to Secretary Morton, Department of the Interior



# LETTER NO. 152



Robert Meyer

116-1 Nimitz Drive

West Lafayette, Indiana 47906

September 26, 1972

Oil Shale Coordinator  
Department of the Interior  
Room 7000, Interior Building  
Washington, D.C. 20240

Dear Sir:

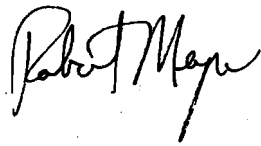
I am a Wyoming citizen going to school in Indiana, so I feel that I should have a voice concerning oil shale development in Wyoming and its neighbors. Wyoming is known for its open spaces, unexploited areas and in general, a quality of life that cannot be touched in the population and industrial centers of this nation. Cheyenne used to brag of having the "cleanest air in the nation," but now I am not so sure. Wyoming is slowly being industrialized, some industries are good, some are bad with respect to harm done to the environment and the quality of life. We cannot escape a modern world, but we do not have to scar and pollute every square inch of this earth. I cannot see where the Department of Interior can justify adverse impacts upon a region due to oil shale development by bringing in fly by night industries and tent towns so that John Doe in New York can live in his own little enclosed world of his air conditioned apartment, air conditioned automobile and air conditioned office. Justification is infringing upon my rights as a U.S. citizen to enjoy the clear streams, clean air and unscarred land that God somehow provided for man to watch over and enjoy.

Wyoming and its clean air and scarcity of people is part of my life as it is with many others. Can the government truly justify

*Ack. from letter of  
10/15/72 (mm)*

denying these rights by oil shale industries? Let us not make hasty decisions and let us also remember that generations after you and I are gone have to live with our mistakes. I would rather put up with a cool clear stream and untouched hills rather than a scummy river and an outline of bulldozed hills and smokestacks.

Yours truly,

A handwritten signature in cursive script, appearing to read "Robert May". The signature is fluid and somewhat stylized, with the first name "Robert" and last name "May" clearly distinguishable.

Grad student in  
electrical engineering

MRS. ROBERT MODEL • MAJO RANCH • VALLEY, WYOMING 82414

October 21, 1972

00112 272 (45)

Director, Office of Hearings and Appeals  
4015 Willson Boulevard  
Arlington, Virginia 22203

RE: Oil Shale Leasing on the Public Lands

To Whom it May Concern:

As a Wyoming rancher and taxpaying citizen of this country, I would like to voice my concern about the proposed "prototype" leasing program for oil shale in Colorado, Utah, and Wyoming.

I do not feel that the Department of Interior is justified in virtually subsidizing (50¢ per acre!) a private industry that is yet in an experimental stage.

With current technology, I understand that only 40% of the oil shale resources can be extracted, and if the necessary and vital environmental safeguards dealing with the problems of tailing disposal and saline water from leaching and dewatering were imposed, oil shale development at present would be economically unfeasible and practically a technological impossibility.

There is an urgent need in this country for a comprehensive National Energy Policy (and for more research on solar energy), but until the government of the United States can come up with some reasonable and responsible guidelines for energy planning, I see no excuse (given present technology) why MY land should be squandered for the oil shale industry.

(For the moment, I foresee many more important uses for my land in Wyoming, Colorado, and Utah: fishing, hunting, wildlife, and the sheer pleasure of observing nature in the few unspoiled acres of the country that remain.)

Thank you for your time in reading this.

Sincerely,

*Robert Model*

(Mrs. Robert Model)

OFFICE OF

OCT 24 1972 (54)

HEARINGS & APPEALS

DIRECTOR OF HEARINGS AND APPEALS

DEPARTMENT OF THE INTERIOR

4015 WILSON BLVD.

ARLINGTON, VIRGINIA 22203

OCTOBER 19, 1972

LETTER NO. 154

Dear Sir,

It is my understanding that there will be hearings, on the development of the oil shale industry in Colorado, in the near future.

I think that your duty in holding these hearings is to urge further investigation of the impact that oil shale development would have.

Areas to be considered in further investigations should include:

1. the removal of used shale (which expands after processing),
2. the problem of lost vegetation and its effect on wildlife,
3. the method of mining the shale and its potential for environmental damage,
- and 4. the ability of nearby communities to provide need services, schools, sewers, hospitals, for the increased immigration to the area.

You also might determine whether the energy crisis is of such a severity to warrant the immediate development of the oil shale industry.

154

I thank you for your consideration.

Sincerely,

Stuart C. Mosk

# LETTER NO. 155

Rodgers C. B. Morton  
United States Department of the Interior  
Washington, D.C. 20240  
October 12, 1972

Action Office *Red Stone Rm. 7000*  
Per info only

Dear Mr. Morton:

I must protest the findings contained in the U.S. Department of the Interior's report on oil shale development in areas of Colorado, Utah and Wyoming. The report seems to neglect two vital areas which quite possibly can avoid the massive environmental damage of oil shale development, yet allow availability of adequate power supplies.

The first of these areas involves the development of alternative, virtually non-environmentally damaging power sources. Oil shale development is not actually feasible technologically, as witnessed by the tremendous costs envisioned in its actuation. These costs are not solely monetary, though monetary costs are significant. The costs are also social; and these costs, realized in their entirety, are prohibitive.

The monetary cost of oil shale development at the present, could probably not be born without extensive governmental (i.e., public) financing. I do not want to foot the cost of this bill when other, and better, sources of power can be developed with the same funds. One such area, which with recent breakthroughs, appears quite promising, is hydrogen fusion, an essentially non-environmentally damaging power source of great reserves. Were the money allotted for oil shale development to be spent on research and development of hydrogen fusion, the results would likely be vastly more profitable socially, and no more costly monetarily.

Also, by developing alternative power sources, the nation's dependence on foreign oil sources can perhaps be reduced beyond the level envisioned with the development of oil shale.

Further mandating against the technological feasibility of oil shale development is the fact that Colorado, Utah, and Wyoming (and the western states in general) do not have an overabundance of water. Already, serious effects are being felt in this area because of the rapid over population of the western states in terms of water supply. The added consumption of water by oil shale development will initiate even more serious difficulties for those of us who live, and wish to remain, in the western states, and who do not desire deterioration of their natural environment. Additionally, depletion of surface and ground water supplies, which will increase the salinity of the lower Colorado River, will not only harm United States agriculturalists of the area, harm fish and other wildlife, and adversely effect the growth of vegetation of the area, but, in all likelihood, will worsen United States relations with Mexico. As I am sure you are aware, there is already considerable Mexican dissatisfaction with the present saline content of the lower Colorado River as it enters Mexico.

Another fact which should not be overlooked is that the United States cannot afford to increase the social tensions already felt among us as a people. This country is experiencing deep division among its people; division which it does not appear can be pushed much further and yet allow a free society to develop. As tension in the social fabric grows, repression of minority social groups is likely to be increasingly felt. A society in which this sort of thing happens can not be considered free, even for a member of a majority repressing group. Deterioration of the western states environmentally, with the accompanying social and economic impact upon those who dwell in the western states will increase the social tensions which already divide the nation. Although oil shale development may not be seriously

objected to until after such development has begun, at the point at which the adverse effects of such development are felt personally by the people of the western states, these people will, in some form, rebel. A more equitable solution for all groups, those which support oil shale development and those which do not, is a compromise measure which harms neither. Any measure which when implemented will seriously harm one group while benefiting another, when alternative measures are available which will harm neither, cannot be considered equitable or just.

A second area which seems to have been neglected in your report, is the possibility of simply using less power. For example, in terms of automobiles, Alfa Romeo, an Italian manufacturer, has, in order to meet emission control requirements, gone to fuel injection, at the same time changing from premium to regular gasoline, improving gas mileage to over thirty miles per gallon thereby decreasing the amount of natural resources consumed, and improving performance. This seems a much more rational approach than that taken in Detroit, in which, through the addition of smog tubes and other emission control devices, the gas mileage has actually been reduced which in turn depletes the world's natural resources more quickly.

Other approaches to using less power are mass transit within the cities, facilities for pedestrian and bicycle traffic and smaller vehicles particularly for town use. In areas such as residential heating and cooling, proper house design can vastly reduce power expenditures.

Many comparable examples exist in which it appears that the problem has not been adequately analyzed prior to adopting a supposedly remedial action. Many "remedies" actually perpetuate, if not increase,



the magnitude of the problems they are meant to solve simply because the ramifications of the initial problem have been ignored in numerous areas. Without considering the long term effects of the problem under focus, the immediate backers of oil shale development may benefit in some areas, but they will do so only by ignoring those who will feel the detrimental effects of such development, and by ignoring the future.

Sincerely,  
*Mrs. M. L. Nettles*  
Mrs. M. L. Nettles  
2985 18th Street  
Boulder, Colorado 80302

## NIELSEN &amp; ASSOCIATES

P. O. BOX 3241, HIGH MAR • BOULDER, COLORADO 80303 • PHONE 303 444-4812

## MEMO-LETTER®

OFFICE OF

OCT 20 1972

TO Mr Jones in Day  
 Dept of Interior  
 Arlington, Virginia 22203

DATE 10/13/72

SUBJECT Oil Shale

Dear Mr Day- As a long time citizen of Colorado I am almost violently opposed to Oil Shale development.

Even if this project were feasible (and the Wednesday clearly indicates it isn't) the environmental effects boggle the mind - tailings - salinity, added fewer plants - Can the oil produced ~~if~~ ever offset the almost certain chaos -

Just tell somebody - Please -

Wayne Nielsen 2655 Leredy Ave. Denver, Colo.  
 80203

LETTER NO. 158  
1729 Athens  
Boulder, Colorado 80502  
October 24, 1972

To: James M. Day  
Director of Office of Hearings and Appeals  
Department of the Interior

Re: Oil shale development in Colorado, Wyoming, and Utah

Sir: Once again, the developers, promoters, and bureaucrats are giving the public a snow job on a project destined to tear up and uglify America the Beautiful, the land that I thought was yours and mine. As for me, I am getting sick and tired of seeing America sold down the drain!

The proposed oil shale development will be the cause of mind boggling proportions of environmental decay. Besides the points raised in the Environmental Impact statement, there are several factors which were not even considered. First, tailings from the project are going to fill several canyons up to one thousand feet deep with sterile black sludge. Besides burying creeks and vegetation, these tailings will absorb heat, increase dust storms, increase salinity, and decrease runoff. In other words, the whole canyon environment will be absolutely sterilized.

This project is going to need a lot of water, which is not exactly abundant out here. So they want to build seven dams for the project. Seven dams!! Seven new silt collectors that the already overworked Colorado River drainage would be so much better without. The impact of these dams has not even been studied.

Nor has the impact of the power plant construction, which will be necessary for the project, been studied. I understand that these plants will be of a scale proportional to those in the Four Corners area.

The government is selling land to those large, private, rich, companies for fifty cents an acre. I, a poor, private citizen, would have to pay thousands of dollars for an acre. (What is all this talk about equality?)

And what is supposed to be the positive result of this great disaster? Thirty-five gallons of oil per ton of rock. The largest mining project in history will come up with maybe four per cent of the oil in the United States.

Now 40,000 jobs for the project does sound very appealing. But come 1985, the project will be phased out by atomic energy, and there will be 40,000 new unemployed. So the area will not only be grossly scarred, but will also be in a great depression. Absolutely raped.

There were hearings on this development in Denver earlier this month, that were announced at the very last minute. There was practically no time to study the impact statement, inform the public, and prepare for the hearings. That meeting was obviously meant as a token appeasement, and was not adequate.

As a citizen, and as a Coloradan, I implore you to do everything in your power to stop this disastrous project. At the very least, arrange more public hearings on this matter.

Sincerely,

*Mark Osborn*

Mark Osborn

OFFICE OF

OCT 30 1972

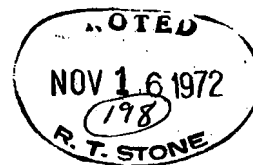
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23 — LETTER NO. 159 ↑

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WHITE HOUSE DC 20500

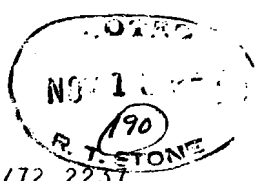
OIL SHALE DEVELOPMENT IMPACT STATEMENT INADEQUATE NEEDS MORE  
ANALYSIS OF WILDLIFE DESTRUCTION  
MR AND MRS L J PADELFORD 2504 HANCOCK ST BELLEVUE NEBR



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*Interior*

LETTER NO. 160



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PMS PRESIDENT RICHARD NIXON

WHITEHOUSE DC 20500

DEPARTEMTN INTERIOR OIL SHALE DEVELOPMENT IMPACT STATEMENT INADEQUATE  
NEEDS CONSIDERATION AND ANALYSIS OF PROBLEMS OF WILD LIFE AND  
HABITAT

DOCIA I PATCHETT ERNESTINE I SMITH 1524 FAIR OAKS CT SANTA ROSA  
CALIF

NOV 15 03 PM '75

95424

CONTROL MESSAGE

Identical telegram sent to Secretary Morton, Department of the Interior

October 19, 1972

Dear Sir;

Before I begin I would like to ask you to include this letter in the public record. I am writing to protest the proposed oil shale project in Colorado. I feel that developing oil shale projects will adversely affect Colorado's natural environment by irreparable damage to the White and Colorado Rivers, and the canyons and lands surrounding them.

As if this project, run by private enterprise, wasn't bad enough in itself, the fact that they want to use public land for it, I think, is an outrage. Let them damage their own land, and leave OUR lands (and waterways) free of their polluting, ravaging enterprise.

I also think it abominable that the public hearings on this project held in Denver on October 10 of this year were not publicized enough to allow for the expression of public interest. How could we protest and show our interest if we didn't even know about the meeting? It seemed to me like a deliberate attempt by someone to push the project through quietly and quickly, without arousing any opposition. This is democracy?

Also, if environmental impact studies have not been done, then they should be. If they are completed, then I think you should be able to see for yourself what the implications of this project are, and abandon it on these grounds. As a

citizen of this country I don't feel I want MY land ruined for the economic interests of the companies involved. The money gained cannot replace the beauty of our land-it is about time we realized this and set our priorities straight. Please do all you can to save Colorado from the scourge of the oil shale project.

Thank you for your time.

Sincerely,

*Marcia Pennix*  
Hallett Hall Box 303  
Boulder, Colorado  
80302

LETTER NO. 162

October 19, 1972

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

OFFICE OF

OCT 24 1972 (60)

HEARINGS & APPEALS

Dear Sir,

As a former resident of California and a present and permanent resident of Colorado, I am deeply concerned about the impact of developing the oil shale potential in Colorado. Several points of fuzzy thinking appear to be common in the statements I have heard and read from public officials.

1. What will the economic effect be on Colorado? Will this state receive sufficient revenue to cover the costs of growth associated with the development of the shales?

2. What will happen when the shales are exhausted? Will we have another Appalachia on our hands? Has any thought gone into developing a stable and permanent economic base in the area to take over after the shales have been fully exploited?

3. What will the long range ecological effects be? Deer and elk populations use this area in migratory fashion; will development disrupt their patterns of movement? Will development affect downstream fishing conditions? What hard and fast guarantees do we have that the area will be restored to its natural state?

4. What will the effect of development be to those already living in the area? Can Colorado do without these areas in agriculture and ranching? How many acres do we let go under the bulldozer before we destroy our economic base?

Until such questions are thoroughly answered and the public made aware of the full costs and the full consequences and the alternatives, it is irresponsible of both Federal and local governments to plan to develop these areas.

As it is now, developers and local governments wave bright prospects before us, talking about revenues and "progress" in the vaguest of terms. We need hard, accurate, supportable figures for both economic and ecological impact.

Sincerely,



Barbara Petit

3635 Goodell Lane  
Fort Collins, Colo. 80521



LETTER NO. 163

COLORADO SEMINARY  
**UNIVERSITY OF DENVER**  
200 W. 14TH AVENUE • DENVER, COLORADO 80204



**COLLEGE OF LAW**

October 31, 1972

NOV 6 1972 (120)

Mr. James M. Day  
Director  
Office of Hearings and Appeals  
4015 Wilson Blvd.  
Arlington, Virginia 22203

HEARINGS & APPEALS

Dear Mr. Day:

Please include my written comments on the Draft Environmental Statement for the Proposed Prototype Oil Shale Leasing Program as part of the official hearing record for Hearings held in Denver, Colorado, on October 10, 1972, concerning the proposed prototype oil shale leasing program.

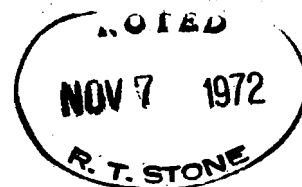
Thank you very much.

Sincerely yours,

James L. Phelan,  
Staff Attorney

JLP:kh

Enc.



## STATEMENT OF JAMES L. PHELAN, ATTORNEY, ON

DRAFT ENVIRONMENTAL STATEMENT FOR THE  
PROPOSED PROTOTYPE OIL SHALE LEASING PROGRAM

Thank you for giving me an opportunity to address myself to one of the most important issues facing our state. I will discuss only a small part of the draft environmental impact statement, the consideration given to the socio-economic effects of oil shale development. After a close and careful study of the entire statement, I must conclude that the statement's treatment of the social and economic impact on the state of Colorado is woefully inadequate.

More specifically, I have the following criticisms of the statement. First, THE STATEMENT FAILS TO ADEQUATELY CONSIDER INCREASED WATER CONSUMPTION BY THE NEW POPULATION BROUGHT INTO COLORADO'S WESTERN SLOPE. Nowhere does the statement offer a detailed analysis of how much water will be needed to support the estimated 33,000 persons who will come into the development area during the initial phase of oil shale development, a fifty percent increase over the present population. (See page III-91, Vol. I) The Denver Water Board has estimated that the 1972 per capita water use in Denver of 226 gallons per person per day will increase to 230 gallons per person per day by 1980, the date when the prototype plants will be in full operation. Based on these and other figures, we can estimate that each person who comes into western Colorado because of oil shale development will consume between 80 and 160 gallons of water per day. Each year that will mean at least an additional 1,577,895,000 gallons or over 6,000 acre-feet of water per year for increased domestic needs. This is over and above the 15,000 to 23,000 acre-feet of water per year needed for production at the two prototype plants alone. (See Vol. I, p. III-35) Water is probably the most scarce commodity in Colorado; it is the key factor to be considered in evaluating the impact of population increase in any part of the state, particularly the arid western slope. Yet, the draft statement makes only passing reference on page IV-14 of Volume I of the need for "development of a water plan to consider regional, municipal, and industrial water supply and water disposal." Similarly, THE DRAFT STATEMENT OFFERS CONTRADICTIONARY WATER USE PROJECTIONS FOR COMBINED DOMESTIC AND INDUSTRIAL USES. On page VII-1 of Volume I the statement cites combined domestic and industrial water use parameters of 116,000 to 164,000 acre-feet per year for one million barrels per day production; figures of 80,000 to 125,000 acre-feet of water per year for the same level of production and the same uses are then given on page VII-5 of Volume I. However, NEITHER PROJECTION FOR DOMESTIC WATER USE IS SUPPORTED BY ANY KIND OF ANALYSIS OR DATA IN THE STATEMENT; it is as if the figures were plucked from different parts of the air.

Second, THE STATEMENT FAILS TO ADEQUATELY CONSIDER THE IMPACT OF OIL SHALE-INDUCED POPULATION GROWTH ON LAND NOW DEVOTED TO AGRICULTURAL USE. Agriculture, like oil shale extraction, is a wealth-producing use of land; housing and streets are not. Therefore, the effect on agricultural lands near population centers in western Colorado is of significant importance to the economy of western Colorado. Yet the statement, while mentioning this problem (see Vol. I, p. III-62), offers no solution and makes no cost-benefit analysis of the change in land-use patterns from agricultural to urban and suburban use.

Third, THE PROBLEMS CREATED BY INCREASED PRESSURE FOR MUNICIPAL SERVICES AND EXPENDITURES IN WESTERN COLORADO ARE INADEQUATELY TREATED IN THE DRAFT STATEMENT. While the statement makes several estimates of increased tax revenues, the statement

neither relates these figures to realistic estimates of increased local revenue needs nor discusses the problem of INTERGOVERNMENTAL TRANSFER OF REVENUES FROM GOVERNMENT UNITS EXPERIENCING THE INCREASED TAX REVENUES TO UNITS SUSTAINING THE INCREASED DEMAND FOR PUBLIC SERVICES. From all indications, population growth will take place primarily in Mesa and Garfield counties and the cities of Grand Junction, Meeker, Rifle, and Glenwood Springs, but 80% of the estimated increase in the local tax base will be generated by the oil shale facilities in Rio Blanco County; therefore ONLY 20% OF THE ADDITIONAL TAX BASE WILL BE IN COUNTIES AND CITIES BEARING THE BRUNT OF THE INCREASED DEMAND FOR PUBLIC SERVICES. How do we get the needed taxes from Rio Blanco County to Mesa and Garfield Counties and Grand Junction and the other municipalities? The statement offers no ideas. Furthermore, the statement inadequately considers the probable demand for better public services than are now available in any of the cities, towns, or counties involved. The new population will probably want services not now available on the western slope of Colorado, services that will have to be provided by local government. Where do the new taxes come from? On page III-82, Volume I, the impact statement considers this problem only with respect to the effect on immigrants' expectations. The statement does not adequately discuss the sources of needed additional revenues. True, some of the new taxes will come from the increased property tax base created by the new homes, support businesses, etc. in each locale. But, for several reasons, these revenues will most likely be inadequate to meet all needs: first, there is a time lag of approximately 36 months between the time a new property is added to the tax rolls and the time when it produces tax revenues (See Vol. I, page III-81); second, the numerous trailer parks that will develop because of projected housing shortages (See Vol. I, p. III-84, 85), will not add significantly to the tax base but will add a disproportionate burden to the demand for public services; and third, per capita municipal expenditures may increase at a marginally higher rate than the corresponding increase in local tax revenues. The importance of these considerations is self-evident, yet they are not treated in the statement as significant tax problems, but are merely presented as problems that new and old residents will have to live with. Furthermore, increased public capital needs are not considered. Figures produced by the Inter-County Regional Planning Commission for projected costs of growth in the Denver metropolitan area suggest that public capital costs per new family coming into an urban area will be \$11,500 in 1971 dollars. This figure could easily double by 1976 or 1980. It covers expenditures for streets and highways, schools, water facilities, parks and recreation, hospitals, sewage disposal, libraries, fire protection, and police stations. IF 12,000 NEW FAMILIES ARE BROUGHT INTO THE WESTERN SLOPE OF COLORADO, THEN THE INCREASE IN CAPITAL EXPENDITURES FOR THE AFFECTED MUNICIPALITIES AND COUNTIES COULD TOTAL AT LEAST \$138 MILLION. Yet, despite the enormity of this figure, the draft statement offers no estimate of how the counties, towns, and cities are going to meet the added expense. A further complication arises when we consider the impact on bonding, the most likely way to finance these capital expenditures. SINCE THE LEVEL OF PERMISSIBLE BONDED INDEBTEDNESS IS A FUNCTION OF THE AGGREGATE TAX BASE IN THE GOVERNMENT UNIT, THE FACT THAT THE GREATEST INCREASE IN TAX BASE WILL NOT CORRESPOND TO THE GREATEST NEED FOR NEW CAPITAL EXPENDITURES MEANS THAT A CITY LIKE GRAND JUNCTION MAY NOT BE ABLE TO FLOAT ENOUGH BONDS TO MEET THESE INCREASED CAPITAL CONSTRUCTION NEEDS. ONCE AGAIN, NO WORD FROM THE ENVIRONMENTAL STATEMENT.

A fourth area of concern not covered in the statement is the question of HOW OIL SHALE-INDUCED POPULATION GROWTH FITS INTO THE TOTAL GROWTH PICTURE FOR THE ENTIRE STATE OF COLORADO. Many people feel that the amount and distribution of growth is the most important issue facing state and local government in Colorado. It is generally accepted that, even without oil shale development, the state's population will increase by 1.6 million persons by the year 2000

and that most of this increase will take place on the Front Range, creating a huge megalopolis from Ft. Collins to Pueblo. This is exactly the kind of problem, now so overwhelming on the eastern seaboard and in California, that can be avoided in Colorado if proper safeguards are enacted--immediately. In its Final Report of March, 1972, the Colorado Environmental Commission, appointed by Governor Love under state statute, argued that Colorado has "reason to be concerned over both the growth and distribution of population in this state," and urged the "institution of a state population distribution and planning process." The Commission recommended that "The General Assembly Enact a Policy of Rural Revitalization, Without Stimulating In-Migration." To accomplish this goal, THE COMMISSION URGED THE STATE TO ENCOURAGE "ANY INDUSTRY LOCATING IN COLORADO TO EMPLOY LOCAL OR INDIGENOUS SKILLS AND TALENTS RATHER THAN IMPORTING THEM." The issue boils down to this: WE MUST STOP ENCOURAGING PEOPLE TO MOVE INTO COLORADO FROM OUT OF STATE, AND AT THE SAME TIME WE MUST REDIRECT ANY NATURAL GROWTH WITHIN THE STATE AWAY FROM THE FRONT RANGE TO OTHER PARTS OF THE STATE, INCLUDING THE WESTERN SLOPE AREA INVOLVED IN THE PROPOSED OIL SHALE PROGRAM. For oil shale development to fit well into a rational program of population distribution in Colorado, it is quite conceivable that a necessary component of the development plan would have to be to either prevent or at least seriously curtail the influx of persons from out of state who would come to Colorado seeking jobs in the oil shale business. There is little question that this would happen, and, I might add, the impact statement does mention the issue of in-migration in one clause of a single sentence. (See Vol. I, p. III-82) But the statement gives no real estimate of the level of that migration. We might learn from the experience of Detroit after the 1967 riots when the city fathers announced the creation of 50,000 new jobs to curb unemployment in the city. AFTER ALL THE NEW JOBS WERE FILLED, DETROIT OFFICIALS FOUND ITS UNEMPLOYMENT HAD INCREASED. THE WORD HAD GONE OUT ON THE JOB CIRCUIT THAT THERE WERE GOOD PICKINGS IN DETROIT. The same thing happened with the migration from rural areas to northern urban centers, with disastrous effects. To help avoid some of the same kinds of problems, specific migration control measures would have to be implemented. At the same time, the potential development of oil shale offers an opportunity to begin redistributing some of Colorado's present population away from the Front Range to the western slope. Yet THE DRAFT STATEMENT NEVER EVEN BROACHES THIS SUBJECT AS TO HOW THE STATE AND LOCAL AGENCIES CAN DEAL WITH THESE PROBLEMS IN THE EVENT THE FEDERAL GOVERNMENT FAILS TO DO SO BY REGULATION OR THROUGH LEASE PROVISIONS.

A fifth problem not covered in the draft statement is the question of WHAT HAPPENS TO THE 33,000 AND MORE INHABITANTS IN WESTERN COLORADO WHO DEPEND ON OIL SHALE FOR THEIR LIVELIHOOD, EITHER DIRECTLY OR INDIRECTLY, WHEN ONE, SEVERAL, OR ALL OF THE PLANTS AND MINES SHUT DOWN. The statement gives no estimate of the life-span of either a single operation or the oil shale industry as a whole if fully developed in Colorado. Nor does it discuss the probably adverse effects on inhabitants and the economy of the area that would occur after partial or complete shut-down of the industry. Again, our own history should have taught us to plan for such contingencies; witness the devastating effect on New England towns of the shift of textile mills to the south and the shoe industry out of the area, or the effect of shutting down military bases in areas that depend on them for a large part of their economic activity. Oil shale promises to have a similarly large role in the economy of western Colorado in the 1980's and 1990's, yet NO PLANS FOR SUCH ECONOMIC CONTINGENCIES ARE EVIDENCED IN THE IMPACT STATEMENT.

Sixth, THE ENVIRONMENTAL STATEMENT FAILS TO EVEN MENTION PROPOSED NEW SOURCES FOR INCREASED ENERGY DEMAND OF THE NEW POPULATION, MUCH LESS DISCUSS

THE POTENTIAL ENVIRONMENTAL EFFECTS OF INCREASED OUTPUT FROM NEW OR EXISTING POWER PLANTS OR THE ENVIRONMENTAL IMPACT OF GIGANTIC TRANSMISSION LINES. The statement vaguely considers power sources for the oil shale operations, but makes no mention of similar needs for the people brought in by the oil shale development.

Finally, and perhaps most importantly, THE DRAFT STATEMENT MAKES NONE OF THE ABOVE-MENTIONED CONSIDERATIONS NOR ANY OTHER SOCIO-ECONOMIC CONSIDERATIONS FOR THE IMPACT OF A FULLY-DEVELOPED OIL SHALE INDUSTRY IN COLORADO. The impact statement gives only limited consideration to the socio-economic effects of five prototype plants, accounting for less than 1% of the potential oil shale to be developed in Colorado. This might mean that all of the socio-economic impacts could be magnified and multiplied by a factor of 9,900%. It also means that the socio-economic projections made in the statement are incomplete and practically meaningless. Furthermore, any consideration of ways to rationalize population increases or properly provide for orderly increase in municipal expenditures and tax distribution may ultimately require that AN UPPER LIMIT BE PLACED ON THE AMOUNT OF OIL SHALE TO BE PRODUCED AT ANY ONE TIME, BASED UPON AN EVALUATION OF HOW LARGE A POPULATION AND INDUSTRIAL BASE CAN BE SUPPORTED ON THE WESTERN SLOPE OF COLORADO. Given the limited supply of water in western Colorado and the direct relationship between increased water demand for domestic use and for oil shale production, it may well be that a level of production well below full capacity would be the upper limit on production. NO SUCH CONSIDERATIONS ARE OFFERED IN THE DRAFT ENVIRONMENTAL IMPACT STATEMENT. The obvious omission of these considerations leads one to believe that technology and profit may once again run rampant over total social and economic needs.

In light of the foregoing criticisms, I offer the following recommendations to help bring the seriously deficient draft environmental statement on oil shale development up to the level of coverage demanded by the National Environmental Policy Act:

1. THE IMPACT STATEMENT MUST MAKE A DETAILED ANALYSIS OF THE INCREASED WATER CONSUMPTION DEMAND CAUSED BY THE OIL SHALE-INDUCED POPULATION INCREASE.
2. THE STATEMENT MUST CONSIDER VARIOUS WAYS THAT OIL SHALE DEVELOPMENT CAN FIT PROPERLY INTO POPULATION GROWTH CONTROLS NEEDED THROUGHOUT COLORADO. SPECIFICALLY, THE STATEMENT SHOULD DEVELOP WAYS, MOST LIKELY THROUGH THE LEASES, TO INSURE THAT COLORADO RESIDENTS ARE GIVEN FIRST PRIORITY ON JOBS CREATED BY OIL SHALE DEVELOPMENT, AS A WAY TO CURTAIL THE PROJECTED LEVEL OF IN-MIGRATION AND TO REDISTRIBUTE THE PRESENT COLORADO POPULATION AWAY FROM THE FRONT RANGE.
3. THE STATEMENT MUST MAKE A DETAILED ANALYSIS OF THE PROJECTED INCREASE IN MUNICIPAL EXPENDITURES AND CAPITAL OUTLAYS AND VARIOUS ALTERNATIVE METHODS TO PROPERLY DISTRIBUTE INCREASED TAX REVENUES.
4. THE ENVIRONMENTAL STATEMENT MUST MAKE A DETAILED ANALYSIS OF WHAT PROCEDURES SHOULD BE DEVELOPED TO MINIMIZE THE ECONOMIC AND SOCIAL IMPACT OF A SUDDEN OR LONG-TERM SHUTDOWN, EITHER TOTAL OR PARTIAL, IN THE OIL SHALE INDUSTRY IN COLORADO, INCLUDING THE POSSIBILITY THAT THE PROTOTYPE PLANTS WILL NOT BEAR FRUIT IN A FULLY-DEVELOPED OIL SHALE INDUSTRY.
5. THE STATEMENT MUST MAKE A DETAILED ANALYSIS OF THE ENVIRONMENTAL IMPACT OF NEW ENERGY SOURCES FOR THE INCREASED POPULATION IN WESTERN COLORADO, INCLUDING THE EFFECTS OF LARGE TRANSMISSION TOWERS AND WIRES.
6. THE STATEMENT MUST MAKE A DETAILED ANALYSIS OF ALL THE SOCIO-ECONOMIC CONSEQUENCES OF A FULLY-DEVELOPED OIL SHALE INDUSTRY IN COLORADO.

Not until these analyses are properly made can the environmental statement be

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LETTER NO. 165

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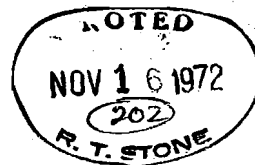
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6 PMS PRESIDENT RICHARD M NIXON

7 WHITE HOUSE DC

8 WE FEEL THAT THE DEPARTMENT OF INTERIOR'S ENVIRONMENTAL IMPACT  
9 STATEMENT ON THE OIL SHALE DEVELOPMENT PROGRAM IS INADEQUATE AND  
10 SHOULD AT THE VERY LEAST GIVE MUCH MORE CAREFUL ANALYSIS OF THE  
11 GRAVE PROBLEMS THE DEVELOPMENT WOULD CAUSE FOR WILDLIFE BOTH  
12 FLORA AND FAUNA. WE SPEAK NOT ONLY FOR OURSELVES BUT THE  
13 UNINFORMED "SILENT MAJORITY"

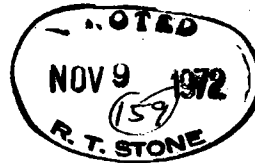
14 JAMES PLYMIRE LINVILLE NORTH CAROLINA



# LETTER NO. 166

318 West Laurel Street  
Ft. Collins, Colorado  
October 25, 1972

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va.



Dear Sir:

I have become increasingly aware of the tremendous lack of concern for the possible detrimental impact of oil shale development upon environmental quality in the state of Colorado. Although the Draft Environmental Impact Statement establishes the necessity for additional research in a number of areas, we are being asked to lease our public lands for the development of the oil shale industry before information from additional studies becomes available. I will not deny that as the population of the United States increases the demand for power becomes a more critical problem, but I strongly question the tapping of oil shale deposits before an honest attempt to minimize damage to the environment is accomplished.

I feel strongly that little has been done to ascertain the contribution of oil shale development to our already increasing problems of air and water pollution. What has been done to minimize damage to the wildlife and vegetation? We must attempt to determine the long term socio-economic problems that such development may create.

As a concerned citizen I strongly urge that more consideration be given to the effect of oil shale development upon environmental quality not only for our sake but for generations to follow.

Very truly yours,

*Rose Anne Powell*

Rose Anne Powell

OFFICE OF

NOV 6 1972

HEARINGS & APPEALS

LETTER NO. 167

715 Parker, 2-C  
Fort Collins, CO. 80521  
Oct. 16, 1972

OCT 20 1972 (2)

RECEIVED & APPEND

Director of Hearings and Appeals,  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Dear People,

I am writing, I'm sure along with many other concerned people, to ask you to think of the terribly damaging effect the oil shale development in the Piceance Basin of Colorado would have on all living creatures. This area is the natural habitat of over 300 species of wildlife. 10 to 20% of Colorado's Mule Deer population, numerous elk, mountain lion, black bear, migratory water fowl, sage, grouse, rabbits, three endangered species of fish, wild horses, raptorial birds such as eagles and hawks and many other small mammals and birds would be left homeless.

The increased population, the air, water, and noise pollution, would all take serious toll on the animal population of the area.

Valuable range area would be destroyed. It would take at least 10 years in order to revegetate the land after exploitation and this process has been tried before with little success & great expense.

This is not even to mention the vast amounts of water that would be used, which is a very valuable & getting scarcer Natural resource. The pollution of the



air, the water, and noise pollution would harm people as well as animal life.

Colorado is one of the more virgin lands left in our Country. It is extremely important that we preserve what little natural environments we have left. So that man can live in harmony with his universe, not as its enemy. Let's start a new way of thinking. The quality of our earthly life should come before the monetary greed of a few inhabitants of our planet. Oil could be imported from the Orient if we need it. President Nixon has stopped this while the Oil companies have favored it, and it would save taxpayers millions of dollars a year. Let's try something new! Let life have more value than money!

Sincerely,  
Carol D'Amico  
Michael D'Amico

OFFICE OF

OCT 19 1972

(38)

October 13, 1972

HEARINGS & APPEALS

Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Dear Sir;

May I again take this opportunity to thank you and your department for again being consistant. Your impact statement on Western oil shale development was very consistant to modern Interior Department standards, sloppy, misleading, inadequate, and completely lacking basic and vital information. I laughed when I read it and then I cried because I realized that many millions of acres of public land are in your bureaucratic, politically motivated hands.

All kidding aside, in my opinion your impact statement needs serious revision. After consultation with professors of hydrology, meteorology, and soils, it appears that your statement is a 1,200 page cover up for the fact that oil shale development at present will cause serious environmental damage to certain areas of the West.

Point; Your impact statement has very little information on effects of air pollution. Yet the small pilot plant near Rifle, Colo. has been closed several times because it could not meet air quality standards. I am staggered at the thought of how much Western skies will be fouled when the major operation begins.

Point; Your revegetation statements are a joke. You are a long ways from practicing what you preach when it comes to replanting spent oil shale, contrary to what your statement says.

Point; your agency has constantly snubbed the contributions of individual and state scientists on the collection of data and its analysis.

I could go on and on but we will both be old men soon and further talk would be useless. The point that I am trying to make sir is that your agency would be wise to revise its impact statement on oil shale development before going on with the project. It is easy to sit in Washington and make monumental decisions on misguided information, but

the people here in Colorado, Wyoming, and Utah are going to have to live with the effects of those decisions for many years to come. And if actual development of oil shale is as big a blunder as the impact statement was, then dark days indeed lie ahead for the Rocky Mountain West.

Undoubtedly, you will whitewash the situation again and tell the nation that oil shale at present is a safe, environmentally sound undertaking, but if the hearings at Denver are any indication, you and your whitewashers are kidding yourselves if you think Westerners will sit back and let our land be butchered! We will fight your bureaucracy to the finish.

I would suggest that your agency quit wasting time and money, and this time, really begin the difficult task of coping with the the massive problems of oil shale development, so that America can benefit from oil shale derived products without sacrificing half of the West in the process.

Yours truly,

*Barry Reiswig*

Barry Reiswig  
Colorado State University

LETTER NO. 170

OFFICE OF

OCT 30 1972

110

HEARINGS & APPEALS

Tuesday,  
Oct. 24, 1972

Director of the Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, VA 22203

Dear Sir,

I was unable to submit a statement at the Oil Shale Hearings held in Cheyenne, Wyoming, on Oct. 12. I would, however, like to request the following article be printed with the testimony given at that hearing.

Also, I would like to request a copy of the testimony of the Cheyenne hearing along with the testimony of all the other Oil Shale Hearings conducted that week in Colorado, Utah and Wyoming.

Thank you.

Sincerely,

Ms. Susan Riske  
Rt. 1, Box 440 C  
Laramie, Wyoming 82070

LETTER NO. 171

October 22, 1972  
931 Alpine Ave.  
Boulder, Co. 80302

James M. Day  
Director of Office of  
Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Virginia, 22203

OCT 30 1972 (6)

HEARINGS & APPEALS

To whom it may concern,

It has recently been brought to my attention that the Bureau of Land Management is seriously considering subsidizing major American oil companies by providing land for environmentally destructive oil shale development in portions of Colorado, Utah, and Wyoming.

Given the fact that a maximum of a 4% increase in oil production will result from these operations, it does not seem realistic to sacrifice our state's land and water environments for such a short-sighted, poorly researched, and ultimately low net-gain operation.

I hereby wish to express my opposition to such a project, and I wish to ask that this statement be included in the Public Record. I also wish to express my dissatisfaction with the irresponsible way in which the announcement of the October 10 Denver hearings were handled.

Thank you for your time and consideration.

To Whom It May Concern,

This is a statement by Gordon Rodda as a concerned citizen. I wish that this be included in the hearing record.

I am incredibly disturbed at the apparent unconcern with which this project is being planned. How can you conceive of such an incredible project; one that would so utterly devastate Colorado and the U. S. without announcing it to all concerned and publicizing it to the fullest extent. Or are you trying to sneak it by without the expected intelligent public outrage? How can one have any faith in a government that deliberately perpetrates a plot to destroy Colorado without huge public input. Is this a government of the ~~business~~ bureaucrats for the oil companies? That impact statement is a farce and you know it. Others have pointed out its inadequacies. I will not bother.

Can you bargain away your children's natural heritage with but barely a pause for a public hearing you will choose

to ignore anyone?

Get off your collective asses and make America a progressive country; not one too riddled with bureaucracy to survive as has been proven time and time again; That which in the long run is economically feasible is that which is ecologically sound. If the oil companies are confident it will work let them do it on their lands.

I can violently oppose to this insane subsidy of the oil industry. Make a realistic study of all the impacts present it to the people. Let the people decide.

OFFICE OF

OCT 24 1972 (52)

HEARINGS & APPEALS

LETTER NO. 173

NOV 6 1972

RECEIVED

14000 E. Progress Way  
Denver, Colorado 80232  
November 3, 1972

Mr. James Day  
Office of Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Dear Sir:

I am very much concerned about the destructive effects that oil shale development in Colorado, Wyoming, and Utah will have on the natural environment of the areas. I strongly urge the Dept. of Interior to prevent such development and to concentrate on less detrimental sources of energy. As I understand the Interior Department's own draft environmental statement on the subject, oil shale development will cause local and extensive devastation of air, water, land, and wildlife. It is incomprehensible to me why such devastation can be considered to be less important than the reported industrial product, i.e. 5 to 10% of the United States' 1985 power needs.

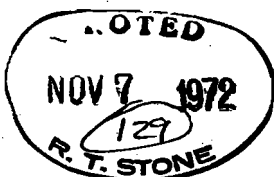
The quality of the air in the vast expanses of the West is rapidly declining as companies in the Four Corners area, and in other parts of Arizona, Colorado, Wyoming, Utah, and other states belch unwanted byproducts into the air. Why should local inhabitants and, if the geography is so designed, inhabitants of down-wind areas hundreds of miles away be privileged to breathe such junk? In the Piceance Creek Basin in Colorado the location of oil shale industry in relation to the mountains and the prevailing westerly winds will ensure that the pollutants in the air pile up against the mountains.

I urge the Interior Department to discourage oil shale development and other industrial development that is basically incompatible with maintenance of clean air, plentiful clean water, plentiful wildlife, and beautiful mountains and flat lands of all the states. Why not intensify efforts to obtain energy from hydroelectric, solar, and internal earth heat sources, wind, and atomic fusion?

Very truly yours,

*Mrs. Walter J. Ruehle*

Mrs. Walter J. Ruehle





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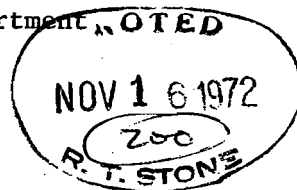
8 WHITE HOUSE

9 WASHINGTON DC

10 SAVER MUCH MORE STUDY OF OIL SHALE DEVELOPMENT PROGRAMS

11 PENNINGTON SATTERTHWAITE 439 EAST 51 ST NEW YORK NY

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14  
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17  
18 Identical telefax sent to Secretary Morton, Department  
19 of the Interior



LETTER NO. 175

OFFICE OF

OCT 19 1972 (51)

HEARINGS & APPEALS

Department of Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

October 14, 1972

Dear Sir,

I am writing to question the problem of oil shale development on the Western Slope. This valuable land should not be utilized without the ultimate in planning and forethought.

In view of this, I hope you will seriously consider further the problem of waste disposal, and wildlife habitat.

Let me thank you in advance for your consideration on this matter.

Sincerely,



Janie Shade  
225 Ingersoll Hall  
Ft. Collins, Colo. 80521

LETTER NO. 176  
October 23, 1972

Dear Mr. President,

We are very much concerned by the news, reported in the Boston Globe Sunday Oct 22, that the Interior Department is about to lease large tracts of land in Colorado, Utah, and Wyoming for the extraction of oil from shale.

We have recently returned from a vacation trip to this beautiful area of the country and were so impressed that we plan to return again next year. We could not find words to describe this land to our friends. The snapshots we took, though color, could only imperfectly convey the image. The only way to appreciate it is to see, feel, and walk through it.

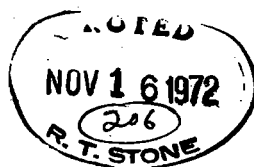
We are shocked to find that this public land — our land — is to be used for strip mining operations.

The callousness of the oil companies, their haste to barrel every drop before anyone finds out what happened — is only surpassed by the indifference of the Interior Department — men appointed to "protect" our public lands. Yet the defenders of the land apparently find it acceptable to "displace" all wildlife within a 25-mile radius of some of the most beautiful canyons in North America. They find acceptable: roads, refineries, pipelines, air & noise pollution and incredibly suggest that this open-pit operation would be a "scenic vista" which would increase tourist traffic.

There are certainly alternatives to this despoilation. The lifting of oil import quotas seems to be the most logical step.

Please see that this leasing is stopped before it's too late.

Thank you,  
Daniel H Shea  
Mary Shea  
31 Pond St Apt #13  
Waltham, Mass. 02154



BUREAU OF  
LAND MANAGEMENT  
CORRESPONDENCE  
CONTROL

NOV 13

RECEIVED

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# Telegram

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LETTER NO. 177

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PMS OFFICE OF THE SECRETARY

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US DEPT OF INTERIOR

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CONCERNED WITH ADVERSE ECOLOGICAL AFFECTS OF PROPOSED  
SHALE OIL DEVELOPMENT PROGRAM PARTICULARLY IN COLORADO  
UTAH AND WYOMING ON PUBLIC LAND PLEASE CONSIDER A FULL  
REEVALUATION OF ENVIORMENTAL IMPACT ON THESE AND OTHER AREAS  
BEFORE TAKING ANY FURTHER ACTION

DEAN E SHELTON JR 402 NORTHAMPTON HURON OHIO



# LETTER NO. 178

OFFICE OF

OCT 16 1972 (39)

HEARINGS & APPEALS

October 10, 1972

Dear Mr. Day:

As a resident of Colorado and a person involved in environmental planning, I am very much interested in the outcome of the proposal to lease land to companies for recovery of Oil Shale in Western Colorado.

It is my understanding that:

1. Dams and powerplants will be constructed to supply power and water for the project--and none of the impacts have been studied.

2. The project will bring, <sup>in</sup> a population of 47,000 --a 40% increase in population.

3. Tailings from the operation will fill several canyons of 800 to 1,000 feet or more in depth.

4. The government will lease the 10,000 acres (initially) to the companies for 50¢ per acre, while private land in the same area sells for \$2,000-\$5,000 per acre to private citizens.

It is very hard to the citizen to verify the above information. I do hope, however, that the environmental and population impacts of the project will be made available for public decision making.

Until then I oppose the project and hope your office will study and make available further information.

Sincerely,

*Nancy Simkowski*

Nancy Simkowski  
Institute of Behavioral Sciences  
University of Colorado  
Boulder, Colo. 80302

LE 179

NO REPLY TO

WHB031(1149)(1-008040C311)PD 11/06/72 1149

ICS IPMPKSA PLA

ZCZC00014 POM MENLO PARK CALIF 15 11-6 807A PST

PMS PRESIDENT RICHARD NIXON

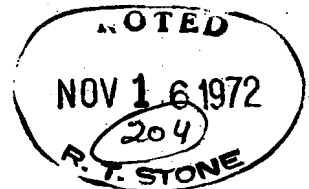
WHITE HOUSE

DC

STRONGLY URGE IMPACT STATEMENT ON SHALE OIL DEVELOPMENT PROGRAM  
DEAL MORE ADEQUATELY WITH WILDLIFE PROBLEMS

RUTH T SMITH MD 1231 HOOVER ST MENLO PARK CALIF

Identical letter sent to Secretary Morton,  
Department of the Interior



Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Oct 20, 1972  
LETTER NO. 181  
OFFICE OF

OCT 24 1972 (56)

HEARINGS & APPEALS

Dear Sir:

I've been reading about the proposed oil shale development in Colorado's Piceance Basin and I am concerned about a prevailing attitude of — will solve the environmental problems as they arise. It seems a foolish attitude when one considers that similar lack of environmental forthought and planning is what's led to so much of Colorado's environmental degradation today. We've had a tremendous influx of people to our state and so little planning — the result being problems with water, air, transportation, social services, and land development. We haven't even solved these problems and to add mining environmental degradation would only be adding another straw to the camel's back.

Colorado is fast becoming ~~an~~ less desirable place to live. Please have solutions to environmental problems of oil shale development before projects are begun. It's often impossible or too expensive to remedy the destruction later on, and no one can replace mountains and canyons, which have their own beauty and usefulness. Please be responsible with our resources, we are a finite Earth.

Sincerely,

Patricia Stegner

613 S. Sherwood  
Fort Collins, Colo. 80521

OFFICE OF

LETTER NO. 182

OCT 24 1972 (67)

October 20, 1972

Dear Sir: HEARINGS & APPEALS

I am a member of the University of Colorado Wilderness Group and I am very concerned about the possible environmental disaster that may occur here in Colorado due to the proposed, wide spread Oil Shale mining which will center around Rifle Colorado which is North East of Grand Junction.

I have read upon the subject and the Wilderness group has also given me information explaining the proposed project and how ridiculous and foolish it really is.

I was also informed, almost too recently that Monday, October 23 is the deadline for anybody wishing to have their dislike and amazement of this incredible, outrageous proposal, included in the oil shale hearing record.

I sent this letter special delivery because I believe that the extra few cents I pay are well worth it if my letter gets there in time to make any small impact at all upon the final decisions made upon the proposed mining.

Please include this letter in the Oil Shale Hearing record and it will be greatly appreciated.

Thank you,

Tom Stinson



LETTER

183

WHA143(1653)(1-837725A312)PU 11/07/72 1651

ICS IPMTBPU MTWN

ZCZC 001 01217 7172263219 ROM TDMT HAWLEY PENN 14 11-07 1012A EST

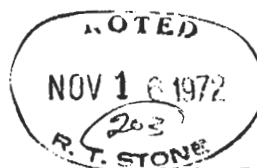
PMS PRESIDENT NIXON

WHITE HOUSE DC

MORE IN DEPTH STUDY NEEDED OIL SHALE EXPLORATION SOUTHWEST

AMHERST ECOLOGICAL ECONOMIC CONCERN IGNORED

MR AND MRS A W STRASSER ROCKY RUN RD HAWLEY PENN 18428



Identical telegram sent to Secretary Morton, Department of the Interior

Charles Dunwoody Strong

ARCHITECT

DENVER, COLORADO 80220

October 22, 1972

Mr. James M. Day  
Director, Office Hearings and Appeals  
U. S. Interior Department  
4015 Wilson Blvd  
Arlington, Va. 2203

Dear Mr. Day:

As a member of AAAS I was interested in the October 6, 1972 Issue of SCIENCE containing an Article dealing with Geothermal Energy. I do not know whether this is relevant or not to the Oil Shale Hearings recently held in this Area, but I would like to ask this question.

Is the proposed development of Oil Shale based upon the need of Oil in the future as a source of Energy, or is based on the failing Oil resources for Motive Power, production of Plastics, etc.? If it is viewed as a source of Energy we have in this State a number of Areas, as shown on enclosed Map, where Pollution Free Geothermal Energy is available.

We have numerous sources of Energy production in this State, such as Oil Shale, Coal Gassification, Uranium, Strip Mining, etc., but all are limited by Environmental Hazards as well as their amounts and time life. As indicated in enclosed Article that would not apply to the use of Geothermal Energy.

Newspaper accounts imply that a final decision on Oil Shale awaits final report on its Environmental impact. We have a very strong association of Environmental Groups in Colorado who have recently rejected a Bond Issue to bring more water from the Western Slope and combined to defeat Wayne Aspinall. Their present attitude is that no matter what the Environmental Report is, that like the one on The Alaska Pipe Line, it will be ignored in favor of Corporate interests.

Under these circumstances a shift to consideration of Geothermal source of Energy might well be given consideration in any decision arrived at as a result of the present Hearings on Oil Shale.

Respectfully yours,

Charles D. Strong  
Charles D. Strong

OFFICE OF

OCT 24 1972

(77)

OFFICE OF

LETTER NO. 185

NOV 6 1972

Nov. 4, 1972

HEARINGS & APPEALS

3415 Newton St

Denver, Colo 80211

Gentlemen,

NOTED  
NOV 9 1972

156

R. T. STONE

I am opposed to leasing my land to experiment with oil shale, especially when private land is available and can be used for this purpose. Why gut land?

It is insane to waste  $\frac{2}{3}$  of any natural resource. Shale oil is not needed.

This is not a priority resource.

It should not be given a license to downgrade other environments and resources including the size of the Flat Tops Wilderness Area. The Parachute Creek area has one of the highest waterfalls in the U.S.A.

This area is arid and exploitation scars will not heal with time.

Don't murder my land.

W. Summers

JOHN R. SWANSON  
P. O. Box 922  
Berkeley, California 94701

LETTER NO. 186

October 30, 1972

OFFICE

NOV 9 1972

HEARINGS & APPEALS

Mr. James M. Ory, Director  
Office of Hearings and Appeals  
Department of the Interior  
4015 Wilson Boulevard  
Arlington, Virginia 22203

Dear Mr. Ory:

Please add my statement, as follows, to your Official Public Hearings Record concerning the Draft Environmental Statement pertaining to this Proposal to Develop Oil Shale.

In this regard, I wish to advise you that I am opposed to any Oil Shale development at this time.

Such proposed development of Oil Shale resources will simply deplete the surface and subsurface resources for all time and such price will by no means be balanced by any economic gains.

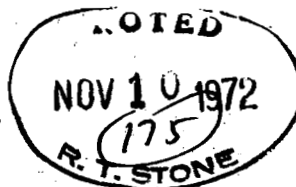
In fact for every dollar gained from the exploitation of Oil Shale, quite possibly some ten dollars will be lost to surface and sub surface land and water resources destruction.

Also, scenic and wildlife resources will be very adversely affected. To the extent that such invaluable resources will be destroyed permanently by even light Oil Shale activities.

The Department of Interior's Environmental Impact Statement concerning Oil Shale Development is very inadequate and I request a Ten Year Study of all Oil Shale possibilities prior to any commercial development-exploitation of any Oil Shale Resources.

Sincerely,

John R. Swanson



Director of Hearings and Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

Oct 22, 1972  
LETTER NO. 188

OFFICE OF  
OCT 24 1972 ①

RECEIVED & APPENDS

Dear Sir:

I would like to take this opportunity to express my opposition to the proposed development of an oil shale industry in the state of Colorado. Coloradans have had it "up to here" with people coming in and raping our land. This is the first time I have ever written a letter to express my opposition to a public issue, but I felt that it was my duty to do so this time.

Granted, the energy needs of the United States are increasing every year. However, the need for rational environmental policy is doing the same. We cannot continue to allow the development of industry at the expense of the environment, which is what the

Department of the Interior is proposing to do. After reading the impact statement of this project, I concluded that little was being done to preserve the environment of the area where the oil shale development would take place. Like most impact statements, it was sufficiently generalized to allow anything to happen to the environment. Furthermore, the statement pointed out that additional research is required in certain areas and that the results of these studies will not be available for two years. For this reason, I submit that the plans for oil shale development in Colorado and the surrounding areas be halted, and that in the period in which studies are being done, that the Department of the Interior should begin to explore alternatives to the use of non-renewable energy resources, such as oil shale. A more worthwhile project might

be to research the possibilities of solar<sup>188</sup> power, fuel cells, etc, which do not drain fossil fuels which are already being burned and polluting our earth.

yours truly,

Sanford Tischer

(74)

1201 W. Plum Apt. C  
Ft. Collins, Colorado  
4 October 1972

Director, Office of Hearings and Appeals  
4015 Willson Blvd.  
Arlington, Virginia 22203

Sir:

Please enter into the public record on oil shale the following statement concerning oil shale development in the Piceance Basin of western Colorado:

Why has an impact statement been drafted and leasing scheduled before thorough investigative research has been completed?

The Colorado Wildlife Division employs the most competent wildlife professionals in the state, yet they have had little opportunity to reveal their research results on oil shale-wildlife impact. In a development project that will seriously affect 10-20 percent of Colorado's mule deer population and will alter migration routes of the world's largest migratory deer herd, I question why the Division has gone unheard or unheeded.

It is one thing to merely state, as the oil shale impact statement has, that there will be effects on wildlife, and it is an entirely different thing to delineate the exact impact of those effects. The impact statement fails to bring out those effects because there has been no time to complete and evaluate necessary wildlife research on the purposed lease sites. A wildlife inventory of the areas, the most basic of wildlife research, has not even been completed. What will be the specific effects of migrational route disruption on deer? Will the animals adapt to alternate routes? Who chooses alternate routes—the deer or presumptuous man? How will federally protected raptorial bird populations be affected? How will increased air pollutants in relation to the predicted night temperature inversions affect wildlife populations? The point here is that the true impact of oil shale development on wildlife or any other resource cannot be evaluated from vague generalities!

RECEIVED

OCT 10 1972

HEARINGS DIVISION



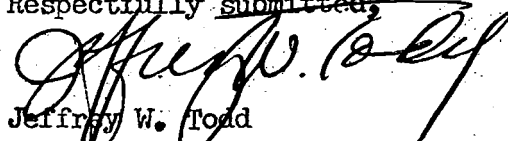
No specifics have been set forth in the impact statement relating hunting-recreation to the overall economy of the Piceance region. Aesthetics (which no impact statement or governmental agency can measure) aside, what is a deer or an elk or an eagle worth to the people who have never seen one but would on some future occasion visit the Piceance Basin to do so? After all, this also is their public land. Once again, merely stating that a loss will occur is not enough. How great a loss will occur? Exactly how many man-recreation-hunting days will be lost as a result of oil shale development??

Escrow bonds of \$500.00 per acre are mentioned in the impact statement. Is an acre which will be irreversibly destroyed because of high grade oil shale lying underneath to be given the same monetary value as an acre which can be restored? Does this \$500.00 figure reflect the going cost of total restoration per acre? Does this figure reflect the cost of the loss of wildlife per acre? Does this figure reflect the dollar loss per acre lost from local economies? Does this figure reflect the restoration cost per acre 20 years hence? What does this figure reflect???

In summation, why has this impact statement been drafted before research results have been evaluated? Why is this impact statement vague and ill-defined? Why hasn't proper time been allotted to answer the multitude of specific questions concerning the impact of oil shale development on wildlife and all related natural resources on our public lands? How can the impact of oil shale development on a dynamic living environment be evaluated by a static impact statement? Are we to launch into a project of this magnitude with this much potential environmental destruction without first knowing the exact results of its outcome?? These questions must be answered knowledgeably before this Environmental Impact Statement adequately fulfills its title. In my opinion, this has yet to be accomplished.

Thank you very much.

Respectfully submitted,



Jeffrey W. Toad

concerned citizen and graduate  
research assistant in wildlife  
biology

Maury M. Travis

TRAVIS RESEARCH INTERNATIONAL

Environment, Ecology, Pollution Pioneer, (1949)  
Colorado

(523 Sherman Plaza)  
901 Sherman Street,  
DENVER, COLORADO 80203  
(303) 255-5267

UNITED STATES GOVERNMENT

(Five Presidents)

1. WORLD WAR II, 3rd Air Force, Photo Intelligence  
PRESIDENT FRANKLIN D. ROOSEVELT: 1942 - 1943, C.D.D.
2. FEDERAL POWER COMMISSION, Washington, D. C.  
PRESIDENT HARRY S. TRUMAN  
(Gas Reserves Section, 1951 - 1952 (Transferred  
1952 to U. S. Geological Survey, Washington, D. C.))
3. U. S. GEOLOGICAL SURVEY, Washington, D. C., 1952  
Conservation Division, Mineral Classification Branch  
Transferred to Casper, Wyoming, District Geologist,  
1952-1956  
PRESIDENT DWIGHT D. EISENHOWER (1953)
4. OFFICE CIVIL DEFENSE  
TWO U. S. CERTIFICATES CIVIL DEFENSE  
(1961 - Alameda, California)(1961 - Battle Creek, Mich.)  
PRESIDENT JOHN F. KENNEDY
5. U. S. DEPARTMENT OF STATE, AID, 1966, VIETNAM  
Recruitment Consultant: Denver: Agricultural  
Scientists and Water Well Engineers.  
PRESIDENT LYNDON B. JOHNSON

## III. OPEN-FILE REPORTS

U. S. BUREAU OF MINES  
U. S. Department of Interior

OFR 31-72. An Economic Analysis of a White Nahcolite Installation in Colorado, Option I, Circa 1971, by Staff, Bureau of Mines, July 1972. 69 pp. 15 figs. Option I is concerned only with material from a "white nahcolite bed" in the Piceance Creek basin, Colorado, containing a high concentration of sodium bicarbonate at a nominal depth of 1,900 feet.

A nahcolite mine and processing plant is designed to mine 8,000 tons of nahcolite ore per calendar day yielding 4,071 tons per calendar day of soda ash product. This will require a total capital investment of \$80,213,200 based on 1971 conditions.

The soda ash will yield an annual income of \$52,749,400. Annual operating expenses including labor, materials, maintenance, taxes, insurance, payroll overhead, and depreciation will be \$18,821,900 in 1971 dollars. The discounted cash flow rate of return is equal to 30.74 percent based on a weighted average depreciation life of 12.88 years. Available for reference during working hours at Bureau of Mines libraries in Denver, Colo., Laramie, Wyo., San Francisco, Calif., Bartlesville, Okla., and Morgantown, W. Va., and at the Central Library, U.S. Department of the Interior, Washington, D.C.

OFR 32-72. An Economic Analysis of an Oil Shale, Nahcolite, Dawsonite Complex in Colorado, Option II, Circa 1971, by Staff, Bureau of Mines, July 1972. 175 pp. 38 figs. Option II concerns mining and processing a nahcolite deposit in the Piceance Creek basin, Colorado, plus an underlying measure of oil shale containing about 25 percent nahcolite and 9 percent dawsonite to yield soda ash, alumina, and shale oil as principal products, coke, sulfur, and ammonia are also byproducts.

A two-level shaft mining operation, including partial refining, and a minerals processing plant requires a capital investment of \$605,947,700 in 1971 dollars to process 8,000 tons per calendar day of nahcolite ore and 60,000 tons of mineral containing oil shale. An income of \$268,283,000 requires \$143,188,700 in annual expenditures including labor, materials, maintenance, taxes, insurance, overhead, and depreciation. The discounted cash flow rate of return is 17.20 percent based on a weighted average depreciation life of 12.99 years. This option differs from Option III in depth of the shale bed mined and analysis of the deposit. Available for reference during working hours at Bureau of Mines libraries in Denver, Colo., Laramie, Wyo., San Francisco, Calif., Bartlesville, Okla., and Morgantown, W. Va., and at the Central Library, U.S. Department of the Interior, Washington, D.C.

OFR 33-72. An Economic Analysis of an Oil Shale, Nahcolite, Dawsonite, Complex in Colorado, Option III, Circa 1971, by Staff, Bureau of Mines, July 1972. 176 pp. 39 figs. Option III concerns mining and processing a nahcolite deposit in the Piceance Creek basin, Colorado, plus an underlying measure of oil shale containing 14.8 percent nahcolite and 11.6 percent dawsonite by weight, yielding 37 gallons of shale oil per ton. Principal products are soda ash, alumina, and shale oil. Coke, sulfur, and ammonia are evaluated as byproducts.

A two-level shaft mining operation, including partial refining, and a minerals processing plant requires a capital investment of \$636,973,000 in 1971 dollars to process 8,000 tons per calendar day of white nahcolite ore and 60,000 tons per calendar day of mineral-bearing oil shale. An income of \$257,599,800 based on 1971 prices requires \$151,373,400 annual operating expenditures including labor, materials, maintenance, taxes, insurance, overhead, and depreciation. The discounted cash flow rate of return is 14.45 percent based on a weighted average depreciation life of 14.155 years. This option differs from

\$636,973,000

NEW PUBLICATIONS (Received 24 Oct '72)  
September 1972 Monthly List 689

Option II in depth of the shale bed mined and analysis of the deposit. Available for reference during working hours at Bureau of Mines libraries in Denver, Colo., Laramie, Wyo., San Francisco, Calif., Bartlesville, Okla., and Morgantown, W. Va., and at the Central Library, U.S. Department of the Interior, Washington, D.C.

## IV. NTIS

The following reprints at \$3 for hard copies, 95 cents for microfiche may be obtained from:

National Technical Information Service  
U.S. Department of Commerce  
Springfield, Va. 22161

Please order by numbers given below:

PS 211 328. Rutile and Associated Heavy Minerals in Florida Phosphate Flotation Plants, by W. E. Lamont, D. R. Brooks, I. L. Feld, and T. N. McVay. December 1968. 35 pp. 6 figs. (BuMines OFR 26-72.) The Bureau of Mines investigated the potential for recovering rutile and associated valuable heavy minerals from the central Florida pebble phosphate district flotation circuits. Studies were made to determine (1) the type and quantity of valuable heavy minerals present at various points in the flotation circuits and (2) the technical feasibility of producing marketable grade concentrates of the valuable heavy minerals. Results of these studies indicated that the feed to the fine fatty acid flotation circuits contained an average of 0.39 percent heavy minerals. Based on available tonnage estimates the following average quantities of valuable heavy minerals should be passing through the district flotation plants annually: rutile, 4.5 thousand short tons; zircon, 14 thousand short tons; opaque (ilmenite), 41.5 thousand short tons; and monazite, 6 hundred short tons. However, heavy mineral recovery was extremely low, ranging from 18 to 23 percent of the rutile, 52 to 63 percent of the zircon, 17 to 29 percent of the ilmenite, and 50 to 56 percent of the monazite. The principal difficulty in achieving high recovery of the valuable heavy minerals was determined to be the fineness of size, which affected both the wet and dry separation techniques used for recovery.

PS 211 412. Evaluation of Anemometers for Use in Coal Mines, by J. F. McCoy. June 6, 1972. 63 pp. 23 figs. (BuMines OFR 22-72.) The purpose of the research described in this report was to evaluate existing instrumentation for measuring air velocities in the speed range under 2,000 feet per minute; to evaluate the method for determining total air volume flow from the velocity measurements; to evaluate new techniques that may be applied to measuring air velocities; and to design a prototype instrument that represents the best technique based on the evaluation. Hot film anemometry was the technique selected for the prototype design. Portable and self-contained, the prototype instrument developed is expected to be approvable for use in gassy mines. The three-phase research program involved (1) a literature and information search, (2) laboratory testing, and (3) instrument design.

PS 211 423. Standardization of Continuous Miner Control Configurations, by William G. Hedling and John D. Folley, Jr. June 28, 1972. 24 pp. 5 figs. (BuMines OFR 25-72.) Continuous miners are operated in an environment that is extremely hazardous to mining personnel working in the vicinity, in-

APPRAISALS & RESERVES  
OFFSHORE SERVICES  
OCEANOGRAPHY

LETTER NO. 180

OFFICE (918) 584-1913  
RESIDENCE (918) 747-7325

OFFICE OF

KORNFELD INTERNATIONAL

Consulting Petroleum Technologists

Suite 610 Midcontinent Building

TULSA, OKLAHOMA 74103

OCT 30 1972 (46)

HEARINGS & APPEALS  
subsidiary:

subsidiary:

TRAVIS RESEARCH INTERNATIONAL  
(523 Sherman Plaza)

901 Sherman Street,

DENVER, COLORADO 80203 PH: (303) 255-5267

Maury M. Travis, U. S. Geol. Survey, '52-'56,  
Environment Pioneer (1949) Colorado

JOSEPH A. KORNFELD, Pres. & Gen. Mgr.  
MAURY M. TRAVIS, Vice Pres., Rocky Mtn. Region, Alaska  
#523 Sherman Plaza, 901 Sherman St.,  
Denver, Colorado 80203  
HOMER E. ROBERTS, Associate, Geophysicist  
434 N. Franklin Ave., 189  
Dallas, Texas 75211  
LOUIS DELMARDINS, Associate, Photogeological Services  
210 Beacon Bldg.,  
Tulsa, Okla. 74103

TESTIMONY : October 10, 1972 \*1  
Denver, Colorado

"THE MYTH OF SO - CALLED MIS - NAMED "OIL SHALE" \*2

(~~NOT~~ "OIL", ~~NOT~~ "SHALE", ~~NOT~~ "COMMERCIAL")  
by

Maury M. Travis

(U. S. Geological Survey, Conservation Division, Mineral  
Classification Branch, District Geologist, Casper, Wyoming,  
1952 -1956 (Northwest Region Headquarters, Canada - New Mexico)

(\*1 - For U. S. Department of Interior, Office of Hearings  
and Appeals, Public Hearing, Denver, Colorado,  
Reclamation Auditorium, Building 56, Denver Federal  
Center : Draft Environmental Statement for the  
Proposed Prototype Oil Shale Leasing Program.

U. S. BUREAU OF MINES

New Publications, September 1972, Monthly List  
689, III, Open-File Reports, page 6 received Denver  
October 24, 1972:

TITLE: OWR 32-72. "An Economic Analysis of an  
Oil Shale, Nahcolite, Dawsonite Complex in Colorado."

"Option II, Circa 1971, by Staff, Bureau of Mines, July,  
1972, 175 pp. 38 figs:

"... A two-level shaft mining operation, retorting,  
partial refining, and a mineral processing plant requires  
a capital investment of \$605,947,700 in 1971 dollars to  
process 8,000 tons per calendar day of nahcolite ore and  
60,000 tons of the mineral containing oil shale..."

TITLE: OWR 33-72: Option III, Circa 1971, ditto  
title above:

"... a capital investment of \$639,973,000 in 1971  
dollars ..."

\*2 Non-marine lake algae, misnamed "oil," in limestone marl matrix, not  
Marine flowing oil of commerce, but substitute hydrocarbons

GEOLOGY

• GEOPHYSICS

• ENGINEERING

ECONOMICS

PHOTOGEOLOGY

Maury M. Travis

October 23, 1972

James M. Day  
Office of Hearings and Appeals  
Department of the Interior

Dear Sir:

I was unable to attend the public hearings held by your department concerning the proposed oil shale development in Colorado, but would like this letter to be put on the record.

I am strongly opposed to large scale "development" of this type without a corresponding large scale impact study on all aspects of the operation. We cannot justify destruction of our environment for this purpose. The plan of dumping tailings into canyons in the surrounding area is completely absurd. And where is all the water for the project to come from? Colorado has enough problems securing good water for residents to use, without the increased demand a project of this type would bring. (Not only water for the industry itself, but also for the thousands of new people it would bring to the state.) Impact of dams and power plants which would have to be built on the White River, the Colorado River, and perhaps others has not been thoroughly investigated; nor have the companies proven beyond a doubt that they will be able to desalinize completely the water they plan to return to the rivers. And finally, I would like to comment on the value of land. The private companies doing the developing are to lease this public land for fifty cents per acre. (Therefore the public--individuals, not huge corporate interests--should have a voice as to the future of this land.) Private land in the same area sells for around \$2,000 on up per acre. However, land is our most valuable resource, and should not be for sale or lease for any purpose that would alter its inherent nature and destroy its value for future generations.

Thank you for the opportunity to express my beliefs, and please, listen to the people.

Sincerely yours, •



Jill M. Twomey

OFFICE OF

OCT 27 1972 (75)

HEARINGS &amp; APPEALS

LETTER NO. \_\_\_\_\_

OFFICE OF

OCT 24 1972 (57)

Oct. 29, 1972

HEARINGS & APPEALS

Dear Mr. James Day,

I am writing to you because of my concern over recent proposals to develop oil shale mining in Colorado, Utah, and Wyoming. As a resident of Breckenridge, Colo. and formerly Steamboat Springs, I have seen the results of much mining in this state and areas around it. I feel the oil shale project is one of regression - a mistake we have made in the past and can avoid in the future. Our resources should not have to cost us so much in permanent damage to our surroundings.

Of course there may <sup>be</sup> those who doubt we can ever escape such a problem of temporary

succeed once we have begun  
to ~~the~~ leave the womb of  
old techniques of obtaining energy  
and enter into the new,  
exploring world of energy sources  
without meaningless waste.

I would like this letter  
included in your oil shale hearing  
record.

We must help each other,  
we are all here together

Thank you for your  
attention.

Robert Neenan

P.O. Box 234

Breckenridge, Colo.

80424

gains being so costly in permanent damage, but these are those of us who are willing to restrict our use of temporary gains and try to experiment on our own in our small way toward wind and solar power which will leave no horrible consequences.

I would hope that you would welcome an exciting challenge to provide us with energy without destroying future sources of energy that are unknown to us now. Let us leave the mistakes of the past and progress to the new energies of the future. With the oil shale development we are passing rapidly past the point of diminishing returns. Let us accept the challenge of the future and go for it we can only



LETTER NO. 194  
OFFICE OF Oct 20, 1972

OCT 24 1972 (6)

Dear Mr. Day, <sup>HEARINGS 3 APPEALS</sup>

Aren't the 60 mph highways  
and the \$5,000 an acre subdivisions  
doing enough to destroy the  
environment without letting the  
oil-shale industry damage  
another 10,000 acres of land in each  
Colorado, Utah and Wyoming.

Huh?

Sincerely,  
Laura Walter

LETTER NO. 195

OCT 30 1972

1180 Edinboro Drive  
Boulder, Colorado 80303  
October 24, 1972

James M. Day  
Director of Office of Hearings and Appeals  
Dept. of Interior  
4015 Wilson Blvd.  
Arlington, Virginia 22203

Dear Mr. Day:

I protest the high-handed methods used to prevent me and the public from knowing adequately in advance about the hearings on oil shale development in Colorado.

I protest this perfunctory bowing to the law, to public opinion, and to decency.

I have asked my Congressman and Senator, <sup>and Governor</sup> to give me an adequate answer as to why you and your department have behaved this way. You no doubt will hear from their staffs.

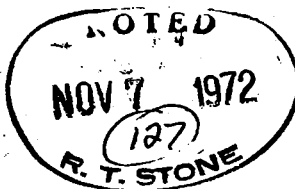
This protest is to be included in the oil shale hearing record. I also wish to record that my dissent extends to the development of oil shale here in Colorado because the environmental impact statement ignores most of the serious implications of such development.

Respectfully submitted,

*William H. Webb*

William H. Webb

cc: Dominick  
Brotzman  
Love



LETTER NO. 196  
Saturday  
September 30, 1972  
(50)

To whom it may concern:

I am writing as a concerned citizen, in the wondrous and magical state of Colorado, to express disgust with the abusive and inappropriate programs for producing consumer energy through oil shale, and <sup>specifically</sup> oil shale mining in this or any other state, where it may endanger what's left of a decreasing balance of nature.

So my knowledge,

the proposed oil shale operation would involve public land on the Western slope of Colorado. As a citizen I would like to have this letter included in the public hearing record to show that I oppose <sup>any mining</sup> operation that would ~~only~~ <sup>cause</sup> spoilage <sup>of</sup> water, wilderness, air and the natural balance.

Its sad that we've wandered far from the land and have little compassion for it and the animals that have their homes and families and existence there.

But I'm not so foolish  
to think that this letter  
will change the madness,  
only bring some attention to  
it & that we all are guilty  
of abusing our lands and  
maybe we'll change.

May the children of  
all men that exploit the  
earth face the horror their  
fathers have created.

Sincerely,

Robin Alexander  
Wenk.

# LETTER NO. 197

1333 University Ave.  
Boulder, Colorado  
October 15, 1972

James M. Day  
Hearings and Appeals  
Department of Interior  
4015 Wilson Blvd.  
Arlington, Virginia

Sir:

In reference to the proposal of the Interior Department to lease a large portion of Colorado public land in the Piceance Basin to private companies for oil shale development, I have been informed that the Interior Department is convinced that there is little public interest in disposal of this land. As a private citizen and resident of Boulder Colorado, I would like to register my protest to your proposal to turn over these lands to private companies for exploitation as I feel that the value of these areas as wilderness far exceeds the economic gains, which will in fact be gains only on a short-term basis. Preservation of these areas as wilderness would not only be a vital asset for Colorado and the nation now in terms of area for ecological research, for preservation of natural habitat and native animal species and for an emotional escape from stress created for many in populated areas; it is also a future investment for all United States citizens. Wilderness areas can never be recovered once they are lost. And I feel that incursion by oil companies into the Piceance Basin area, with accompanying dams, powerplants, increased population and destruction of land will create damage that is irreversible to this area.

I urge that the Interior Department reconsider any proposals that would so constitute a threat to any wilderness areas in Colorado, and elsewhere in the nation, unless there has been extensive study into the nature of the proposed change, and the value of the wilderness area in question has been properly estimated. I do not believe it has in this case.

Sincerely,

*Susan Wight*

(95) Dear Mr. Morton,

11-5-72  
LETTER NO. 198

The Dept. of the Interior's environmental impact statement on the oil shale development program is inadequate, and should give more careful analysis of the problems the development would cause for wildlife, including several endangered species.

all aspects of our environment should be looked into very carefully before we start tearing up millions of acres of landscape.

Sincerely,

Richard C. Wilson

2111 Nimitz Drive  
Des Plaines, Ill. 60018

92/290

124 Briarwood Rd. # 722  
Ft. Collins, Colo.

Oct. 26, 1972

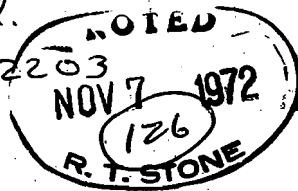
LETTER NO. 199

Director of Hearings & Appeals  
Department of the Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203

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HEARINGS & APPEALS



Dear Sir:

I am writing you to express my protest of the government's program of oil shale development in Piceance Basin. It is my hope that the government will look more closely into alternatives to the program. For example, a 40% decrease in the demand by 1985 may ~~also~~ offer a solution to the energy consumption problem.

The Piceance Basin has much potential for appreciation by man and I fear that any



program rushed into hastily<sup>199</sup>  
may cause irreversible damage  
to the Basin and its possible  
aesthetic value. I believe  
that a thorough study of the  
problem may result in a  
program acceptable not only  
for the people of Colorado, but  
also the environment.

Sincerely,

David L. Young  
member of  
CSU Zero Population Growth

LETTER NO. 200



1319 Eighteenth Street NW Washington DC 20036 telephone (202) 467-5810

October 20, 1972

Mr. Reid Stone  
Oil Shale Coordinator  
U. S. Department of the Interior  
Room 7000, Interior Building  
Washington, D. C. 20240

Dear Mr. Stone:

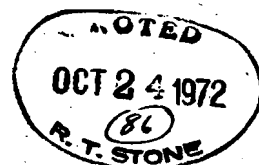
Although time and the pressure of other activities will not permit thorough study of the "Draft Environmental Impact Statement for the Proposed Prototype Oil Shale Leasing Program", I would like to go on record in support of the manner in which the Department of the Interior is going about this development. Apparently, every precaution will be taken to avoid serious environmental damage.

It is important that we find out if these shale deposits are an economical source of energy. It is equally important that adverse environmental impact be minimized. Therefore, I support the proposal to make available for private development these six leases on a competitive royalty bid basis, provided proper environmental safeguards are received. It appears that potential hazards do not make the prototype leases too dangerous and we can proceed with reasonable assurance of safety.

Sincerely,

*William E. Towell*

William E. Towell  
Executive Vice President



LETTER NO. 201

TOWN OF MEEKER

MEEKER, COLORADO 81641

November 6, 1972

OFFICE OF

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James M. Day  
Director of Hearings and Appeals  
U.S. Department of Interior  
4015 Wilson Blvd.  
Arlington, Va. 22203



HEARINGS & APPEALS

Gentlemen:

It is my desire to present, for the first time, the views of the Town of Meeker on the Environmental Statement for the proposed Oil Shale Leasing Program.

Initially, allow me to express my appreciation for the copies of the studies sent to us for examination and for allowing the town to have a voice in the decisions that are being made. We were unable to send a town representative to the meetings held in various locations throughout the state, due to our various personal business commitments.

The problems presented in the three volumes are truly monumental, but for a country and industry that have sent rockets to the moon, should certainly not be insurmountable.

With proper controls and guidelines, oil shale mining can be a real industry basically pollution free and although the land would be temporarily disarranged, replacement and replanting can leave the terrain more productive and beautiful than originally found.

The impact of the population influx is one, that we as an adjacent municipality, must recognize and in our small way, attempt to prepare for. This is the area which involves us most and one with which we must have help in preparing for. We are not the first small town to feel pressures being exerted, nor will we be the last, but planning engineers, both Federal and industrial, can ease us into a new era. Increased sanitation facilities, implementation of water systems, enlarged schools and other necessary construction must be financed and well engineered.

To accomplish these things on our present tax base would be an impossibility. Our police and fire departments, as well as other city services, are adequate at present and could be slowly improved and expanded with a natural growth, however, 100 new families migrating into our town "overnight" would strain all our facilities.

These are problems for us to solve, just as the oil industry is faced with its mining difficulties. With proper planning, financing, and technology, the oil shale industry can be made a part of our community.

Very Truly yours,

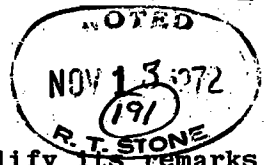
*Edwin Jirak*  
EJR

Edwin A. Jirak  
Mayor, Town of Meeker

EJ/emd

ADDITIONAL COMMENTS OF THE  
LEAGUE OF WOMEN VOTERS OF COLORADO  
ON THE  
PROPOSED OIL SHALE LEASING PROGRAM  
November 3, 1972

LETTER NO. 202



The League of Women Voters of Colorado would like to amplify its remarks at the October 10th hearing on the Proposed Prototype Oil Shale Leasing Program. We request that these comments be made part of the official hearing record.

First, we thank the Department for allowing an extra two weeks for comments. The potential magnitude of shale oil development in our state obliges the citizens as well as business and governmental interests to examine the proposal as carefully as possible.

On balance we feel that although the Environmental Impact Statement provides a good inventory of environmental problems likely to be encountered in shale development, it falls short of fulfilling the requirements of NEPA in a number of respects.

1. It does not furnish "a detailed statement" (emphasis ours) on the environmental impact of the proposed action, adverse environmental effects, or alternatives -- as set forth in Section 102. It cannot furnish these details, because the necessary base-line information has not yet been developed.

We are aware that the Prototype Leasing Program is intended to demonstrate how the different means of extraction would work and therefore provide realistic information on actual environmental impacts. We question, however, whether it is wise to authorize even this limited objective in the absence of important basic environmental data.

The type of information we are referring to is being developed by the Colorado four-area study on oil shale environmental problems, coordinated by the Colorado Department of Natural Resources. One of the components, the Environmental Inventory and Impact Study, due December 1974, is to provide data on the physical, biological and some social aspects of the ecosystems of the Piceance Creek area for use as a base-line in assessing impacts related to the proposed development of oil shale, and to assist in the decision-making process. Included will be scientific analyses of:

- Geology
- Climatology
- Air quality
- Hydrology
- Soils
- Scenic resources
- Fresh water biology
- Water quality and toxicology
- Cold-blooded vertebrates
- Warm-blooded vertebrates
- Disease vectors
- Vegetation
- Anthropology, archeology and history
- Recreation resources

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The three other studies in the group of four will examine regional and community development and land use - including an important resource inventory; revegetation; and water resource management. These are to be finished in 1973.

Thus the information which ought to be in an Environmental Impact Statement as required by NEPA will not be available until the end of 1974--time enough for its use in the Lessees' Detailed Plans but not in time for the Secretary to use in his decision on the Leasing Program.

202

2. In view of the estimated emissions of sulfur oxides, nitrous oxides and fugitive dust listed in Volume I, III, pp. 42-52; the statements in Volume I, III, pp. 52-53 that "The impact of this cumulative loading on ambient air quality cannot be determined with available data but will tend to reduce annual visibility", and "The long term effect of industrialization in the region would result in a decline in general air quality" - we believe it is imperative that additional base-line data be developed before any further decisions are made.

The Colorado Air Pollution Control Commission has established ambient air standards for the state for suspended particulates and sulfur dioxide which are among the most stringent in the nation. The part of the state where the proposed leasing program will be implemented is one of the now "clean" areas of the state where essentially "non-degradation" ambient air standards are in effect. It is the position of the League of Women Voters, and many other citizens who testified at the hearings on the ambient air standards for Colorado, that we support a "non-degradation" policy for the now clean areas of our state.

It is difficult to tell from the Draft EIS what the estimated emissions would be for each proposed site. Since Colorado would have the largest share of the shale development, it would appear that the greatest impact would be on our state. 340 tons per day of sulfur oxides, under full development, emitted into the entire air-shed is  $2\frac{1}{2}$  times the total present daily emissions of all sources of sulfur oxides in the state. This surely is not a small impact in terms of air quality!

We are equally concerned because we do not see documented or even mentioned anywhere the cumulative impact on our ambient air of the Proposed Leasing Program and the already known power plant development in the Four Corners area, Utah, Craig, Colorado, and Wyoming.

Unless and until it can be demonstrated how the Proposed Leasing Program will affect our ambient air levels we would have to oppose the leasing program for lack of sufficient data on its impact on air quality.

3. With regard to water requirements we question the assumption in the Draft EIS that there will be enough water for oil shale development and that water quality problems can be solved. Not only would there be considerable impact on the whole Colorado River basin, but there would be tremendous impact on our state's water resources. We are especially concerned about the following:

- \* The ramifications of augmentations, impoundments, desalting, diversions and weather modification. Can we take for granted that new water projects will be environmentally and politically acceptable?
- \* The effect of the new discount rate
- \* The legal difficulties of conversions of adequate water rights
- \* The potentially severe degradation of ground and surface water

4. The Draft EIS points out that most of the expected new population as far as Colorado is concerned will probably be living in Rio Blanco County;

but "Rio Blanco County would not get the benefit of any of the local taxes paid by that plant. (Volume III, IV, p. 58) This situation is likely to lead to considerable "environmental impact" in Rio Blanco County. Should this not be further discussed in the EIS, and should there not be an attempt to mitigate the problem?

202

5. We would like to amplify further the potential of solid waste as a source of energy. Agricultural activities alone generate 2.5 billion tons of solid wastes annually - this is more than half of all solid wastes from all sources. The pollution emanating from much of this waste has become a massive problem. Would it be any more experimental - or costly - to establish a collection system for at least part of this organic waste so that it could be connected to low-sulfur fuel oil than to set up the oil shale program? Would it not be better to help solve two problems than to create additional environmental decline by the proposed oil shale development?

The disposal of municipal solid waste in densely populated urban areas has also created a massive problem. The technology is available to convert this waste to BTU gases which, if utilized, could provide an almost limitless source of energy. Charleston, W. Virginia, has embarked on a full-scale program to utilize its solid waste for energy which is expected to become self-supporting in a short period of time. Would it not be more productive to examine the development of energy from municipal waste than from oil shale? Does it really make sense for us to bury an energy source in landfills --while digging up another source at great environmental cost to the West?

6. Expending our finite energy resources to power the current transportation system is demonstrably inefficient. Active encouragement by the Federal Government of development of transportation modes which require less energy to move more people and goods in a more efficient way should be fully explored as a viable alternative to oil shale development, and not dismissed lightly as it is in the Draft EIS. A balance sheet weighing the economic, social and environmental factors would help determine the best course of action.

7. To go one step further - our nation lacks an overall energy policy. We urge the Secretary to look carefully at the commitment of such vast environmental resources to an industry that would provide only 4% of the total oil utilized nationally.

Again, may we urge your close consideration of the concerns raised herein and thank you for this opportunity for amplification.